

Order Hymenoptera, family Chalcididae

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INTRODUCTION

The Chalcididae belong to a medium-sized family of parasitoids with 96 genera and 1469 species in the World (Aguiar et al., 2013). Their size ranges from 1.5 to 15 mm and their body is hard with surface sculpture consisting of umbilic punctures. They are predominantly black, sometimes with yellow and/or red markings, rarely with metallic reflections. The sexual dimorphism is minimal except in Haltichellinae, where the flagellum of the male is thicker and the scape possibly modified (Plates 18–21).

Recognition: The family belongs to the huge superfamily Chalcidoidea, which now includes 22 families (Heraty et al., 2013). In this group the mesosoma exhibits a special triangular sclerite – the prepectus – which separates the pronotum from the tegula (Plates 7, 8). This plate is also present in Chalcididae but is quite reduced here (Plates 5, 29). The family is mostly recognized by the enlarged metafemur, which is toothed or serrulate on the ventral margin, and the strongly curved metatibia (Plates 26, 48, 57, 94, 131). Some representatives of other chalcid families (Torymidae: Podagrionini and some Pteromalidae: Cleonyminae) also have an enlarged metafemur (Plate 9) but here the prepectus is expanded as usual and well visible as a triangular plate (Plate 8); in addition the relevant groups exhibit metallic reflections (Plate 7). Finally the sculpture of the propodeum is quite different: it is almost always areolate in the Chalcididae (Plate 3), but never exhibits such ornamentation in the non-chalcidid families (Plate 6). The Leucospidae, with the single genus *Leucospis* Fabricius, 1775, would also be mixed with the Chalcididae as they also share their character states. Their females are easily recognized through the outstanding ovipositor, curving upward and then forward along the dorsal surface of the metasoma; furthermore the notauli are absent here, conversely to the situation in the chalcidids, where they are percurrent and most often impressed (Plate 13).

Classification: The relationships between the Chalcididae and other family are still obscured despite recent efforts to infer the phylogeny of the whole superfamily using morphological and molecular data (Heraty et al., 2013). The Chalcididae were usually classified into five subfamilies e.g. Chalcidinae, Epitraninae, Dirhininae, Smicromorphinae and Haltichellinae. There is some doubt about the monophyly of the Chalcidinae. Hence the Cratocentrini were recently upgraded to a separate subfamily as they are the sister group of the remaining chalcidids. It is quite possible that other tribes presently included in the Chalcidinae will be upgraded to their own subfamilies. Steffan (1957b) underlined the importance of the petiole structure to separate the different taxonomic groups.

Distribution: The family is cosmopolitan but much more diverse in tropical countries. An account of their distribution was provided by Steffan (1958a).

Hosts and biology: The Chalcididae are pupal (idiobionts) or larvo-pupal (koinobionts) parasitoids of holometabolous insects. Most species are endoparasitoids, but Dirhininae are ectoparasitoids within the puparia of their Dipteran hosts. The favourite hosts are Lepidoptera but Diptera, Coleoptera, Neuroptera and even Strepsiptera are also quoted. Some species are primary parasitoids and sometimes facultative hyperparasitoids while a few other chalcidids are obligatory secondary parasitoids. This is for example the case of the *Brachymeria* species belonging to the *minuta* species group, which parasitize tachinid or sarcophagid flies, themselves primary parasitoids of Orthoptera (Steffan, 1959b).

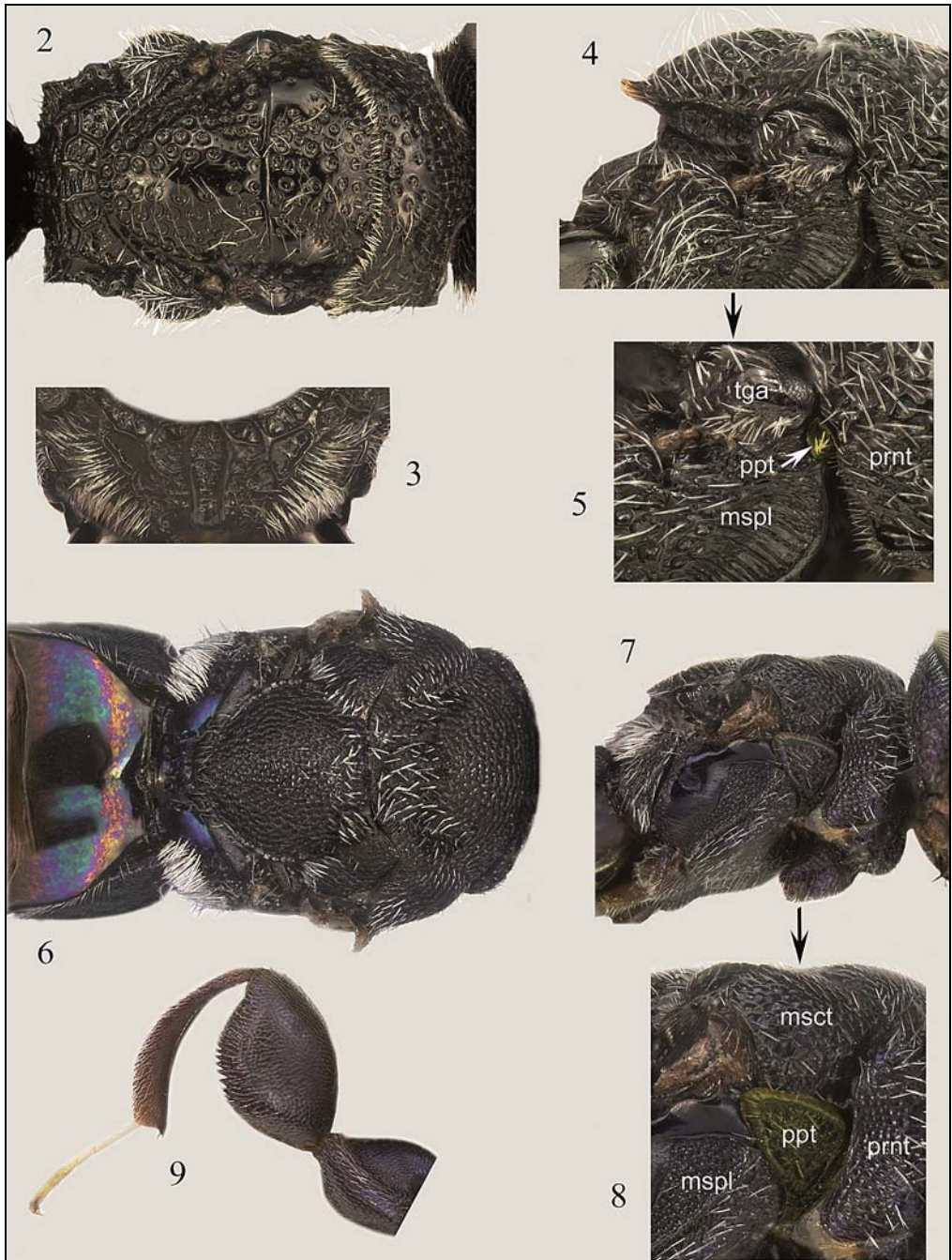


Plate 1. General habitus of a Chalcididae: *Brachymeria persica* (Masi) (female).

Economic importance: The chalcidids are not a group of major economic importance as the level of parasitism is most often relatively low; therefore they are not able to keep the populations of their hosts at a desirable level. Nevertheless, *Brachymeria tibialis* (Walker, 1834) was successively introduced in North America to control the Gypsy Moth, *Lymantria dispar* (Linnaeus, 1758). In South America a conservation control strategy against defoliators (Lepidoptera and Coleoptera) of the oil palm plantations was successively implemented by the establishment of attractive plants bearing extra floral nectaries; the Chalcididae were an important component of the parasitoids collected on these plants (Delvare & Genty, 1992). Recently several chalcidid species of economic importance were described from Iran (Delvare et al., 2011).

MATERIALS AND METHODS

Specimens were collected by Antonius van Harten using various techniques, the most efficient for the relevant family is the trapping with Malaise and water traps. Specimens received in ethanol were first sorted to morphospecies and representatives of each of them prepared on rectangular cards so that most morphological characters are visible, especially the ventral side of the mesosoma and the mandibles. The sample was compared with a reference



Plates 2–9. Comparison between Chalcididae/non Chalcididae morphology. 2: *Psilochalcis dentata* (Steffan) (female), mesosoma in dorsal view. 3: *Antrocephalus cameroni* n. n. (female), propodeum. 4–5: *Indoinvraia* aff. *bouceki* Roy & Farooqi (male); 4: Mesosoma in lateral view; 5: Prepectus. 6–9: *Chalcedectus sinaiticus* (Masi) (Pteromalidae Cleonyminae) (female). 6, 7: Mesosoma respectively in dorsal and lateral view; 8: Prepectus; 9: Hind leg.

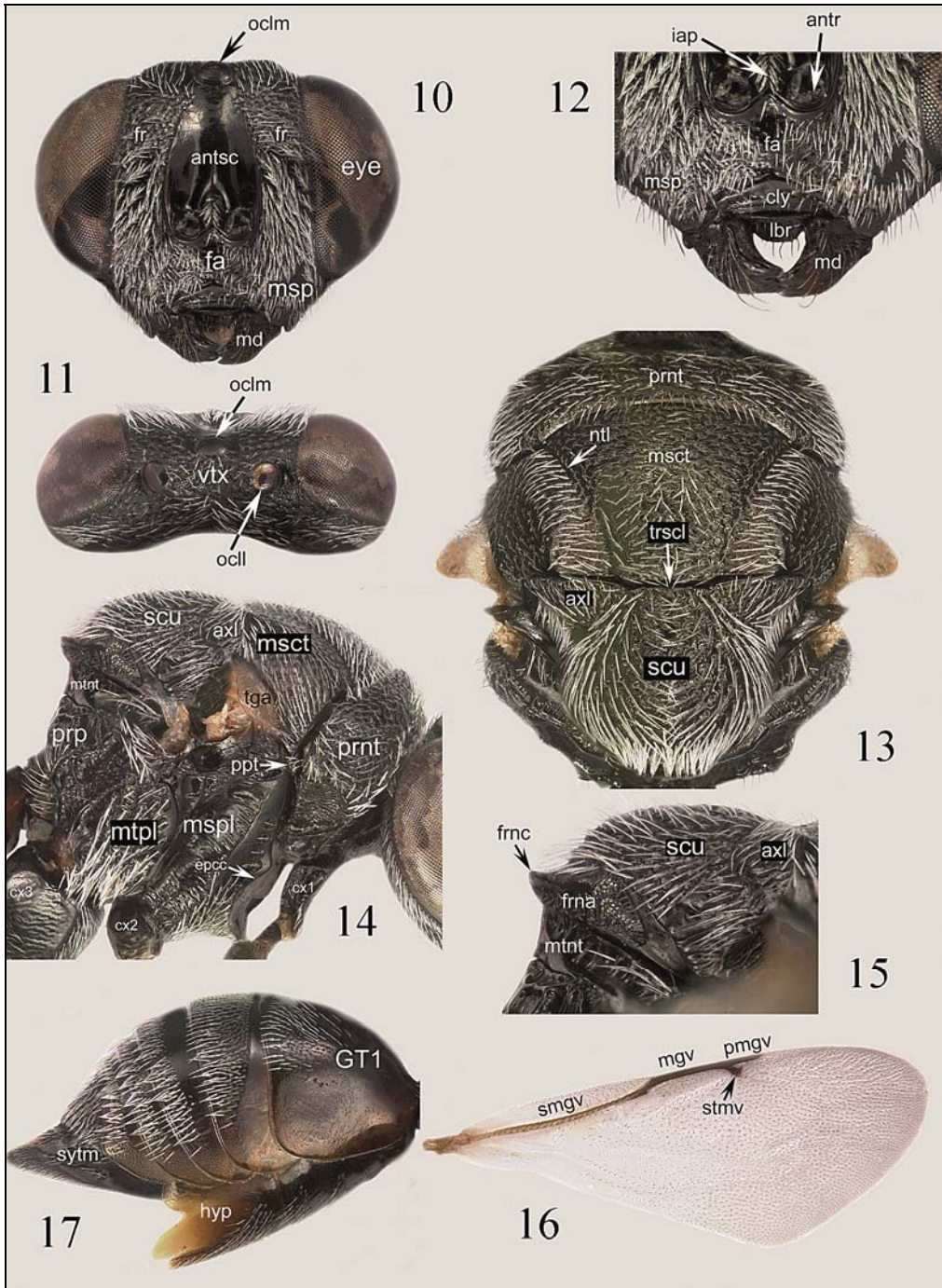


Plate 10–17. Morphology of a Chalcididae. *Brachymeria persica* (Masi) (female). 10, 11: Head respectively in frontal and dorsal view; 12: Lower face; 13, 14: Mesosoma respectively in dorsal and lateral view; 15: Scutellum in lateral view; 16: Fore wing; 17: Gaster in lateral view.

collection itself identified by comparison with most types of the Palaearctic and Afrotropical regions. Some species evidently originating from India were identified using Narendran's monograph (1989). Anyway, reliable determinations need the examination of the primary types. Hence several species from the Arabian Peninsula could not be assigned to a described name.

Abbreviations (used in Plates) – antr: Antennal toruli; antsc: Antennal scrobes; axl: Axilla (shaded); axlp: Posterior projection of axilla; axlu: Axillula (shaded); cly: Clypeus; cx: Coxa; epcc: Epicnemial carina; fa: Lower face; fr: Frons; frna: Frenal area; frnc: Frenal carina; GT1: First gastral tergite; hyp: Hypopygium; iap: Interantennal projection; lbr: Labrum; md: Mandible; msct: Mesoscutum; msp: Malar space; mspl: Mesopleuron; mtnt: Metanotum; mtpl: Metapleuron; ntl: Notaulus; ocll: Lateral ocellus; oclm: Median ocellus; ppt: Prepectus (shaded); prnt: Pronotum. prp: Propodeum; scu: Scutellum; spcl2: Mesothoracic spiracle; sytm: Syntergum (= epipygium); tga: Tegula; trscl: Transscutal line (or suture); vtx: Vertex. Antenna: als: Anellus (= fl1= first flagellomere); cva: Clava; fl, f7: First, seventh funicular segments; pdl: Pedicel; scp: Scape. Veins: mgv: Marginal vein; pmgv: Postmarginal vein; smgv: Submarginal vein; stmv: Stigmal vein.

BIOGEOGRAPHY

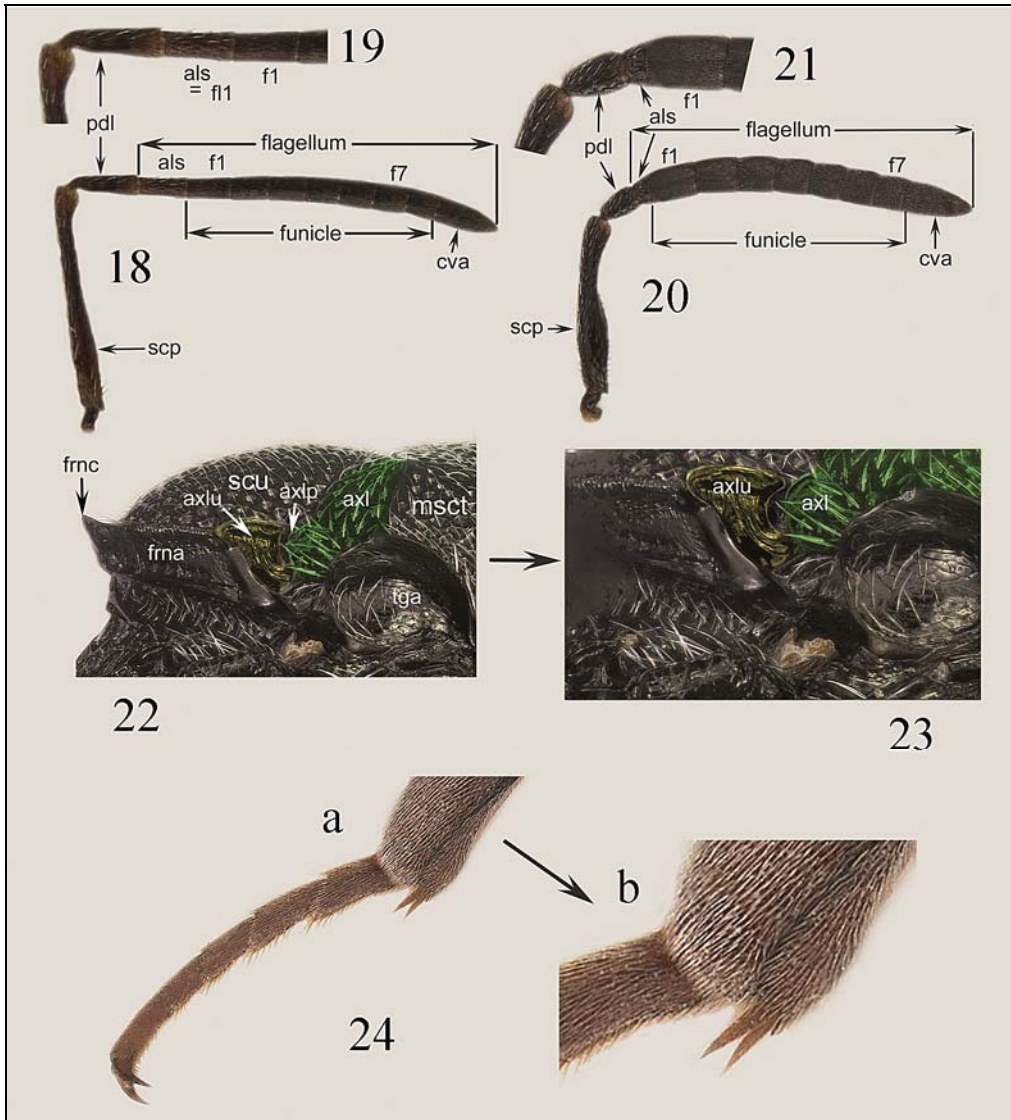
Altogether at least 74 species of Chalcididae are present in the UAE representing about half of the described species in the Palaearctic region.

A new partition of the zoogeographic regions of the World was recently proposed (Holt et al., 2013). The distribution of the Chalcididae from the UAE fits very well this pattern as we found here species from the Mediterranean Basin, Afrotropical Region, Central Asia and India. It is nevertheless possible that, in a few cases, the present distribution is artificial, resulting from introductions. In fact and during several centuries, an intense trading occurred in the Indian Ocean between India, Arabian Peninsula and the eastern seaboard of Africa downward to Madagascar. Parasitoids living at the expense of insects infesting seeds and pods might very well have been introduced despite the fact that the time spent in cargoes would previously have been greater.

SYSTEMATIC ACCOUNT

Key to genera, females of Haltichellinae

- 1 Head with frontal horns (Plates 50, 51). Metasoma with short, striolate petiole, transverse in females (Plate 53), at most $1.5 \times$ as long as wide in males (Plate 50). Metafemur with serrulate ventral margin (Plate 56) Dirhininae: *Dirhinus*
- Head without such horns (Plates 11, 95, 114). Metasoma sessile (Plates 1, 34, 78, 93, 128, 138, 150, 161, 168, 171), or petiole several times longer than broad (Plates 57, 60, 64). Metafemur sometimes toothed (Plates 26, 37, 41) 2
- 2 Metasoma with very long, striate petiole, several times as long as wide (Plates 57, 60, 64). Marginal vein extremely long relative to the very short stigmal vein (Plate 63) or absent (Plate 67). Antennae inserted on a protrusion (Plate 59) or a frontal lobe, near oral fossa (Plate 66) Epitraninae: *Epitranus*
- Metasoma sessile (Plates 1, 34, 78, 93, 128, 138, 150, 161, 168, 171), rarely petiole subquadrate (in one *Hockeria*, Plate 104). Marginal vein relatively shorter than in *Epitranus* (Plates 16, 31, 39, 72, 79, 91, 99, 105, 111, 117, 126, 137, 149) 3



Plates 18–24. Morphology of the Haltichellinae. 18–21: *Lasiochalcidia pubescens* (Klug): Antenna, pedicel and base of flagellum respectively of the female (18, 19) and of the male (20, 21). 22–23: *Hockeria metula* (Nikol'skaya) (female). 22: Scutellum in lateral view; 23: Axillulae; 24: *Kriechbaumerella destructor* (Waterston) (female), apex of metatibia.

- 3 Metatibia obliquely truncate or even ending as a curved spine; at most 1 apical spur visible (Plates 32, 38, 42). Axillulae not differentiated (Plate 15) 4
- Metatibia apically truncate at right angle and bearing 2 spurs (Plates 24, 90). Axillulae laterally raised (Plates 22, 23) Haltichellinae 6
- Note. The male genera of that subfamily are keyed out separately. See below.

- 4 Mesosoma showing transverse crests on pro- and mesonotum (Plates 28, 35, 36). Metatibia ending in a curved spine (Plates 32, 38). Appendices reddish brown but without yellow parts (Plate 26) 5
- Mesosoma with umbilic punctures on pro- and mesonotum (Plate 13). Metatibia obliquely truncate at apex (Plate 42). Legs and tegula with yellow parts (Plates 1, 41) Chalcidinae Brachymeriini: **Brachymeria**
- 5 Metasoma in females with elongate syntergum enclosing the ovipositor sheaths (Plate 34). Postmarginal vein hardly longer than stigmal (Plate 39) Chalcidinae Phasgonophorini: **Trigonura**
- Metasoma in females with short syntergum but with long ovipositor sheaths (Plates 25, 26). Postmarginal vein longer than marginal and much longer than stigmal vein (Plate 31) Cratocentrinae: **Philocentrus**
- 6 Marginal vein of fore wing along wing margin (Plates 72, 77, 92, 98, 111, 117). Postmarginal vein always present, sometimes short 7
- Marginal vein somewhat removed from wing margin (Plates 100, 127, 142, 153, 160, 165). Postmarginal vein absent 12
- 7 Clypeus subtrapezoidal, in same plan as frons, without dorsal ridge (Plates 69, 74, 75). Antennal toruli distant from the dorsal margin of the clypeus 8
- Clypeus transverse and reflexed, delimited by a dorsal ridge (Plates 86, 87, 107, 113). Antennal toruli adjacent to the dorsal margin of the clypeus 9
- 8 Metafemur entirely reddish, with wavy serrulate ventral margin (Plate 77). Interantennal projection protruding and discoid (Plates 74, 75). Scutellum with frenal carina delimiting anteriorly a reflexed surface (Plate 77) **Rhynchochalcis**
- Metafemur black, with protruding teeth at mid length, followed by a convex apical lobe (Plate 73). Interantennal projection vestigial, visible as a bump (Plates 68, 69). Scutellum without frenal carina but with apical median tooth (Plate 71) **Belaspidia**
- 9 Frons with horseshoe-like carina, formed by the preorbital carinae on either side, joining together on vertex between the median and lateral ocelli (Plates 106, 108, 112, 114). Frons completely and deeply excavated 10
- Frons without such carina (Plates 85, 95). Frons more narrowly impressed 11
- 10 Pronotum with dorsal oblique carinae directed to the posterior margin and sometimes forming submedian protrusions there (Plates 119, 128). Metafemur with wavy ventral margin at level of serrulation (Plate 120), at most with one tooth at mid length (Plate 116) **Antrocephalus**
- Pronotal carinae absent dorsally, restricted to sides (Plate 108). Metafemur with 3 ventral serrulate lobes or teeth (Plate 110) **Kriechbaumerella**
- 11 Metacoxa densely setose at base (Plate 83). Metatibia with additional carina on outer side (Plate 84). Postmarginal vein clearly longer than the stigmal (Plate 81). The white spot of the fore wing near the stigmal vein bearing somewhat obscured setae (Plates 79, 80) **Euchalcis**
- Metacoxa bare or sparsely setose dorsally at base (Plates 89, 102). Metatibia without additional carina on outer side. Postmarginal vein short, rarely longer than the stigmal (Plate 92). The white spot of the fore wing near the stigmal vein bearing white setae (Plates 91, 98) **Hockeria** (most species)
- 12 Membrane of fore wing uniformly white and bearing white setation (Plates 99, 100). Metafemur with tooth at mid length, followed by apical lobe (Plate 101) **Hockeria** (1 species)
- Membrane of fore wing sometimes slightly to distinctly infumate and always bearing dark setae, at least from base of marginal vein (Plates 126, 137, 141, 149, 164). Metafemur

- with first tooth near its base, followed by wavy ventral margin and apical lobe (Plates 125, 129, 130, 143, 147, 166) **13**
- 13** Metatibia with apicodorsal areola delimited by raised carina (Plate 148). Mesofemur with very long setae along ventral margin (Plate 146). Metafemur with long setae along dorsal and base of ventral margins (Plate 147) *Bucekia*
- Metatibia without such areola. Meso- and metafemora with shorter setae **14**
- 14** Head, mesosoma, fore and mid legs orange (Plate 131); metasoma and hind leg black. Scutellum with protruding submedian apical lobes separated by deep incision (Plate 135). Propodeum with long and sharp latero-posterior teeth (Plate 136). Vestigial veins of fore wing underlined by dark streaks (Plate 137). Antenna with ventral area of micropilosity reaching the base of clava (Plate 134) *Indoinvrea*
- Body colour different: Head and mesosoma mostly to entirely black, metasoma generally black dorsally, sometimes reddish (Plates 128, 161, 167, 168, 171, 173). Scutellum frequently rounded posteriorly (Plate 156) and propodeum often without such teeth (Plates 61, 171). Vestigial veins of fore wing visible as folds only (Plates 160, 164). Area of micropilosity on clava rarely expanded as such **15**
- 15** Scutellum evidently convex and ending in protruding median or submedian lobes directed upward (Plates 123, 124). Left mandible 3-toothed (Plate 122). Hind leg mostly to entirely red (only base of metacoxa and tarsus sometimes darkened) (Plates 125, 129, 130). Frons thickly setose ventrally, the setation masking the integument (Plate 121). Head strongly transverse in dorsal view with antennal scrobes not or hardly impressed and temples very narrow (Plate 128). Basal tooth of metafemur not enlarged. Fronto-clypeal lamina absent .
..... *Lasiochalcidia*
- Scutellum hardly convex and/or with rounded posterior margin, hence lacking any lobe (Plates 156, 157, 163, 168, 171, 173). Left mandible 2-toothed (Plate 155). Lower face sometimes sparsely setose. Head not so transverse and/or scrobes better impressed (Plates 154, 161, 167, 168, 171). In a few species head with protruding fronto-clypeal lamina (Plate 170). On some other species basal tooth of metafemur enlarged and sulcate (Plates 158, 159) **16**
- 16** Metasoma with 2 submedian carinae at base of first gastral tergite (Plate 173) [be careful: the carinae are sometimes short]. Basal tooth of metafemur neither enlarged nor sulcate. Head without fronto-clypeal lamina *Proconura*
- Metasoma without such carinae (Plates 161, 167, 168, 171). In some species head with protruding fronto-clypeal lamina (Plate 170). In other species basal tooth of metafemur enlarged and sulcate (Plates 158, 159) *Psilochalcis*

Key to genera, males of Haltichellinae

(male of *Euchalcis afra* unknown)

- 1** Marginal vein along fore wing margin (Plates 92, 98, 105, 111, 117). Postmarginal vein always present although sometimes short **2**
- Marginal vein somewhat removed from wing margin (Plates 100, 149, 153). Postmarginal vein absent **6**
- 2** Clypeus subtrapezoidal, in same plane as frons and delimited dorsally by change in sculpture only (Plates 69, 75). Antennal toruli distant from clypeus **3**
- Clypeus transverse, somewhat reflexed and delimited dorsally by a ridge (Plates 87, 113). Antennal toruli very close to clypeus **4**

- 3 Scutellum ending in two submedian lobes formed by the frenal carina which delimits anteriorly the reflexed area (Plates 76, 77). Interantennal projection protruding and discoid (Plate 70). Fore wing with white setation *Rhynchochalcis*
- Scutellum with median tooth at apex, without reflexed stripe (Plate 71). Interantennal projection reduced to a bump (Plate 69). Fore wing with dark setation (Plate 72) *Belaspidia*
- 4 Frons with horseshoe-like carina formed by frontal carinae on either side, joining each other on vertex between median and lateral ocelli (Plates 106, 108, 112, 114). Frons completely and deeply excavated 5
- Frons without such carina (Plate 85). Frons not so impressed *Hockeria* (most species)
- 5 Pronotal carinae visible on dorsum of pronotum and directed toward its posterior margin where they form submedian protrusions (Plate 119). Serrulate margin of metafemur wavy (Plate 114), sometimes with a small tooth at mid length (Plate 116) *Antrocephalus*
- Pronotal carinae restricted to sides, absent from dorsum of pronotal collar (Plate 108). Serrulate margin of metafemur forming 3 distinct lobes or teeth (Plate 110) *Kriechbaumerella*
- 6 Fore wing membrane white and bearing white setation (Plates 99, 100). Metafemur with projecting tooth at mid length, followed by apical lobe (Plate 101) *Hockeria* (one species)
- Fore wing often more or less infumate or/and bearing dark setation, at least from base of marginal vein (Plates 126, 137, 141, 149, 164). Metafemur with first tooth near its base, followed by wavy ventral margin and apical lobe (Plate 143) 7
- 7 Scutellum showing convex dorsal outline in lateral view and ending as median or submedian projecting lobes (Plates 123, 124; Plates 139, 140). Frenal carina visible and delimiting a continuous reflexed surface. Left mandible 3-toothed (Plate 122) or fore wing with Rs1 underlined by a distinct dark streak (Plates 141, 142) 8
- Scutellum with flat or hardly convex dorsal outline and/or rounded posteriorly, the frenal carina obsolete or delimiting extremely narrow vertical surface, only present laterally (Plates 145, 157, 162, 163). Left mandible always 2-toothed (Plate 155). Vestigial veins visible only as folds (Plates 153, 160, 164). In doubtful cases basal tooth of metafemur enlarged and sulcate (Plate 158, 159) 9
- 8 Left mandible 2-toothed (Plate 155). Hind leg entirely black (Plate 143). Submedian lobes of scutellum horizontal, quite protruding, and separated by narrow and deep incision (Plates 139, 140). Vestigial veins of fore wing, especially Rs1, underlined by dark streaks (Plates 141, 142) *Indoinvraia*
- Left mandible 3-toothed (Plate 122). At least metafemur red, sometimes brownish on disk (Plates 125, 129, 130). Scutellum either ending as median or submedian lobes directed upwards or with small submedian projections (Plate 124) *Lasiochalcidia*
- 9 Metatibia with small apico-dorsal, incompletely delimited, areola (Plate 152) [be careful in examining this character]. Mesofemur and tibia bearing relatively long, white setae (Plate 151) *Bucekia*
- Metatibia without such areola. Mesofemur and tibia bearing shorter setation 10
- 10 Metasoma with submedian carinae at base of first gastral tergite (Plate 173) [be careful as the carinae are sometimes short]. Scutellum with hardly convex dorsal outline. Basal tooth of metafemur as usual, neither enlarged nor sulcate [to be examined in lateral and ventral views]. Scutellum with rounded posterior margin, without any incision or projections. Head never globose in dorsal view *Proconura*

- Metasoma without such carinae (Plates 161, 167, 168, 171). Scutellum sometimes with convex outline. Basal tooth of metafemur occasionally enlarged and sulcate (Plates 158, 159). Scutellum eventually with small apical emargination separating short, submedian projections (Plate 162). Head sometimes globose in dorsal view (Plates 168, 171) *Psilochalcis*

Review of subfamilies and genera

Subfamily **Cratocentrinae**

Until recently this group was classified as a tribe within the Chalcidinae; it was recently upgraded to subfamily (Heraty et al., 2013) as it is most probably the sister group of the remaining Chalcididae. The phylogeny was inferred by Wijesekara (1997) and the subfamily was revised by Steffan (1959a). As far as is known all Cratocentrinae are parasitoids of xylophagous beetles. This is a small, probably relictual group, presently including 22 described species, mostly palaeotropical in distribution. In addition to *Philocentrus*, the fauna of Arabian Peninsula possibly includes the genus *Cratocentrus* Cameron, 1907, which is otherwise distributed in Sahara and North Africa on one side and Iran on the other side.

Cratocentrinae figure most of the largest chalcidid wasps, surpassing 10 mm in length. The hard body shows areas of appressed and dense, silvery or golden, setation (Plates 25, 26). The antennal insertion are close to the clypeus, the mesopleuron is deeply impressed as a femoral scrobe (Plate 26); the propodeum is vertical between the short lateral and angulate projections (Plate 30), the metatibia ends as a curved spine and does not bear any spur (Plate 32); the postmarginal vein is much longer than the stigmal (Plate 31); the metasoma is broadly sessile with a vestigial petiole; the gastral tergites 2–4 are reduced and mostly hidden below the first tergite (Plate 33); the females have long and exposed ovipositor sheaths (Plates 16, 26).

Genus *Philocentrus* Steffan, 1959

The genus was only known from its type species, *Philocentrus argenteolus* Steffan, 1959, described from Senegal. The series from the UAE belongs to an undescribed species. It was reared from a twig of *Euphorbia larica* infested by the longhorn beetle *Idactus iranicus* Breuning, 1975 (Petr Janšta, pers. comm.). *Philocentrus* is very close to *Cratocentrus* and can be separated from it by the absence of teeth on the vertex and the truncate axillae which have a vertical posterior slope.

Philocentrus sp.

Plates 25-33

Number of specimens collected: 2. Collecting locality: Fujairah.

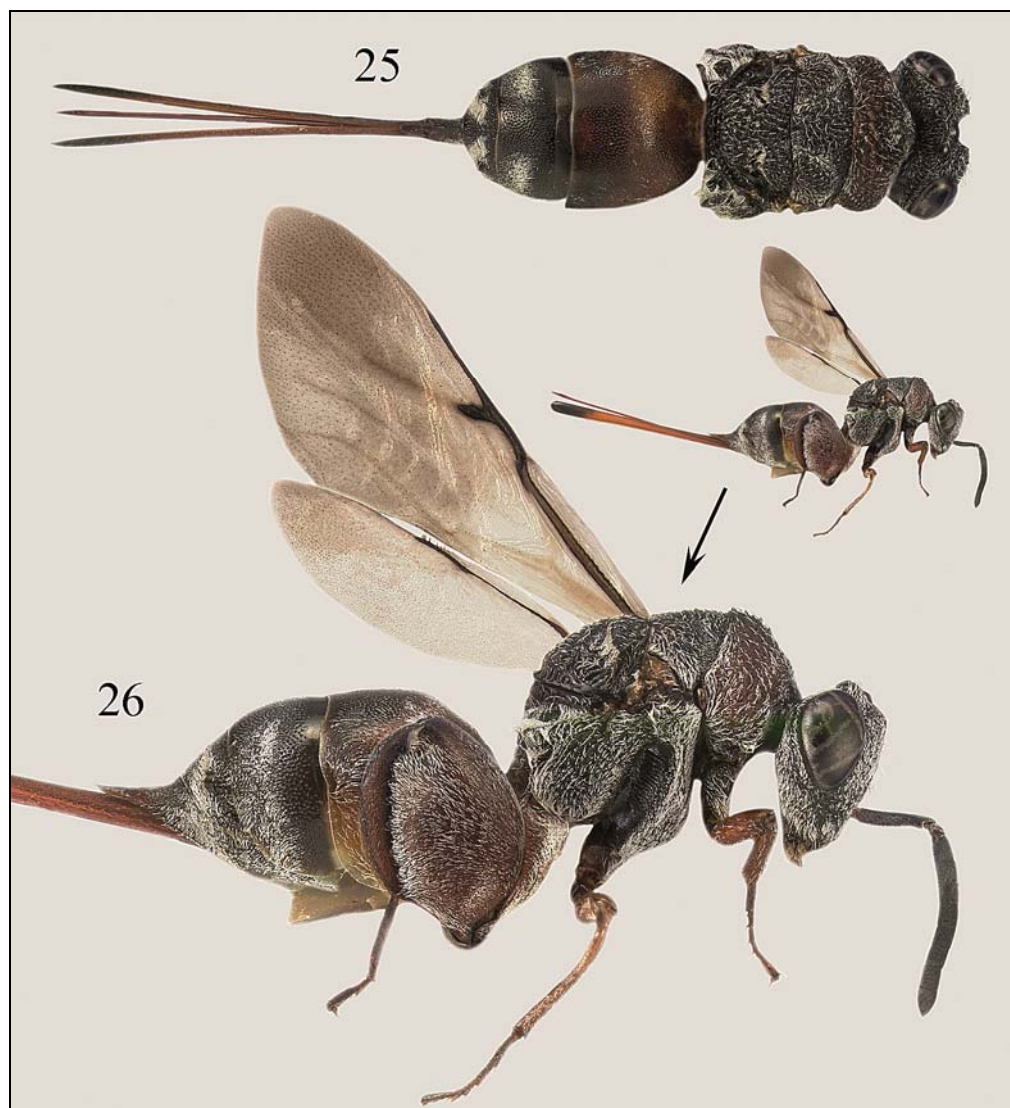
Subfamily **Chalcidinae**

The subfamily is heterogeneous, not supported by any derived character and will possibly be split. It is therefore preferable to deal with the tribes presently included there.

Tribe **Phasgonophorini**

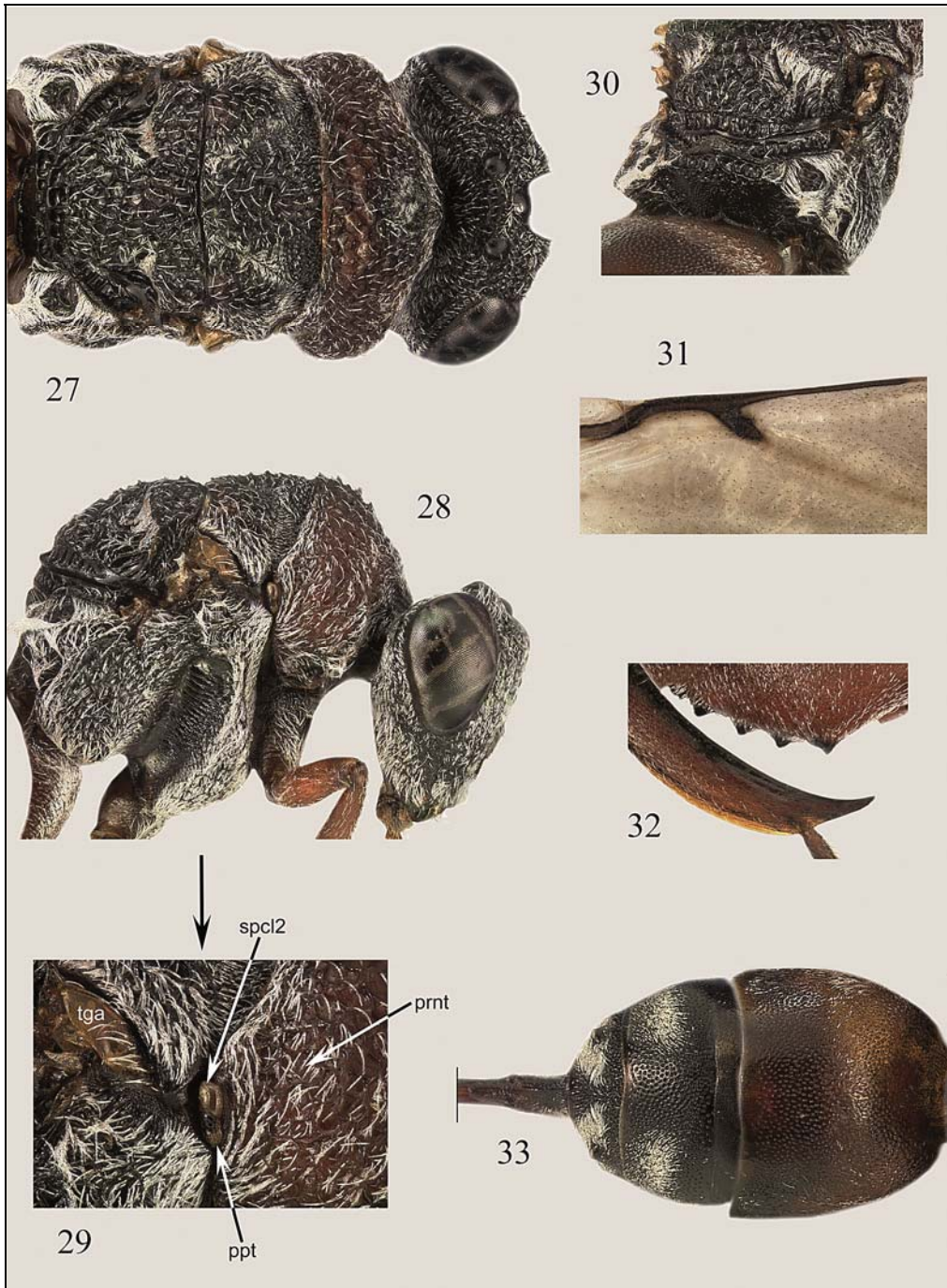
The tribe presently includes 62 species worldwide. It has a cosmopolitan distribution but is much more diverse in tropical regions. The phylogeny was inferred by Wijesekara (1997).

The Oriental species were reviewed by Narendran (1989), the Australasian by Bouček (1988), the Neotropical species by Steffan (1973) and the New World genera by Bouček (1992). All species are apparently parasitoids of xylophagous beetles. An account of the biology of *Trigonura rubens* (Klug, 1834) was provided by Mateu (1972).



Plates 25–26. Habitus of *Philocentrus* sp. (female), respectively in dorsal and lateral view.

Conversely to the Cratocentrinae, the postmarginal vein in Phasgonophorini is only slightly longer than the stigmal (Plate 39). The tribe includes two different groups, i.e. the *Stypiura-Megalocolus* group, respectively distributed in the Neotropical and Indo-Australasian regions, and the *Trigonura* group, of Palaetropical and Holarctic distribution. In this second set the basal gastral tergite is enlarged conversely to the smaller following ones (Plate 34). These chalcidid wasps also exhibit large size and hard body. The head has no malar sulcus, the dorsal mesosoma shows transverse crests as for xylophagous beetles (Plate 36), the metasoma is sessile and the females often have long syntergum enclosing the ovipositor sheaths (Plate 34).



Plates 27–33. Characters of *Philocentrus* sp. (female). 27–28: Head and mesosoma, respectively in dorsal and lateral view; 29: Prepectus; 30: Propodeum in latero-dorsal view; 31: Fore wing venation; 32: Apex of metatibia; 33: Gaster in dorsal view (ovipositor sheaths not shown).

Genus *Trigonura* Sichel, 1866

Within Phasgonophorini, *Trigonura* is defined negatively respectively from the Nearctic *Phasgonophora* Westwood, 1832, and the Australasian *Trigonurella* Bouček, 1988. The type species of the first genus exhibits a basally truncate gaster [other species presently quoted in the genus actually belong to *Trigonura*], the second a modified frons. Hence, *Trigonura* might well be paraphyletic relative to these genera.

Two species were collected in the UAE, respectively *T. rubens* (Klug) and *T. ruficaudis* (Cameron). The first was described from Sudan and is known from Sahara (Mateu, 1967) and Israel (Bouček, 1956). It was reared from xylophagous beetles infesting *Acacia*. The second species was described from India and quoted from buprestids and long horn beetles (Narendran, 1989); the author also examined specimens collected from Iran.

Trigonura rubens (Klug, 1834)

Number of specimens collected: 1. Collecting locality: Khor al-Khwair.

Trigonura ninae (Nikol'skaya, 1952) = *Centrochalcis ruficaudis* Cameron, 1913 nec *Trigonura ruficaudis* (Cameron, 1907). Plates 34–39

Number of specimens collected: 2. Collecting locality: Al-Ajban.

Centrochalcis ruficaudis Cameron, 1913 cannot be used as it is a secondary homonym of *Phasgonophora ruficaudis* Cameron, 1907, both species belonging to the genus *Trigonura* Sichel. An available name is *T. ninae* (Nikol'skaya, 1952), a junior synonym of the first one. Therefore *T. ninae* is proposed here as a replacement name for *Centrochalcis ruficaudis*.

Tribe **Brachymeriini**

The tribe is mostly represented by the cosmopolitan genus *Brachymeria*. *Caenobrachymeria*, initially described as a subgenus by Steffan (1974) was upgraded by Bouček (1992) and *Ceyxia* Girault, 1911, was recently revalidated by Andrade & Tavares (2009). Nevertheless the quoted supports for such a generic level are very slight. Furthermore, these decisions implicate that other species groups of *Brachymeria* would be upgraded to genera, resulting in extensive taxonomic confusion. Finally, *Brachymeria* is supported by uniquely derived states.

Genus *Brachymeria* Westwood, 1829

The genus – including the species presently classified in *Ceyxia* and excluding synonyms recently discovered but not yet published – includes about 350 described species worldwide. It is supported by the presence of special, spatulate setae on the hind pretarsus (Plate 43) and the basal hamulus removed from the following on the hind wing (Plate 45). Otherwise the body is mostly black, sometimes partly or entirely red, and exhibits yellow markings on the tegulae and legs (Plates 1, 41). The antennal scrobes are smooth and well delimited from the rest of the frons by peripheral carina and show a smooth surface (Plate 40). The postmarginal vein is somewhat longer than the stigmal (Plate 1). The metatibia is obliquely truncate at apex and bears one spur (Plate 42). The metasoma is sessile with the body of petiole entering within the petiolar foramen.

The species are morphologically somewhat diverse. The most evident character is the relative length of the syntergum, which was used to erect the genus *Thaumetelia* Kirby, 1883, and the subgenus *Neobrachymeria* Masi, 1929; anyway, this character proved to be homoplastic with species included there actually belonging to unrelated taxa. Potential characters to delimit species groups within *Brachymeria* include: Pattern of the setation on various parts of the body, presence of preorbital carinae on frons and postorbital carinae on genae, presence and orientation of the postgenal/postoccipital carinae, habitus of the scutellum, habitus of the



Plates 34–39. Characters of the genus *Trigonura*. *T. ninae* (Nikol'skaya, 1952) (female). 34: Habitus in dorsal view; 35: Mesosoma in lateral view; 36: Sculpture of mesonotum; 37: Hind leg; 38: Apex of metatibia; 39: Fore wing venation.

epicnemial carina delimiting anteriorly the ventral shelf of the mesopleuron, colour pattern and ornamentation respectively of the metacoxa, femur and tibia, punctuation of the gastral tergites, presence of lateral foveae on syntergum, etc. Nevertheless no extensive study has been undertaken and inferring the phylogeny of the genus is still badly in need of elucidation. Not less than 14 species were collected in the UAE. None of them were reared but the literature provides hosts for a number of them. *P. podagrica* (Fabricius), a cosmopolitan species described a number of times, parasitizes calliphorid and sarcophagid flies developing



Plates 40–47. Characters of the genus *Brachymeria*. 40–45: *B. persica* (Masi) (female). 40: Head in frontal view; 41: Hind leg; 42: Apex of metatibia; 43: Hind pretarsus; 44: Hind wing; 45: Hamuli. 46–47: *B. kassalensis* (Kirby) (male). 46: Flagellum in ventral view; 47: Base of flagellum showing the modified setae.

on carcasses. Other species of the *minuta* species groups also parasitize Diptera, sometimes as hyperparasitoids of Lepidoptera or Orthoptera (Steffan, 1959b). *B. albicrus* (Klug) is a parasitoid of Nymphalidae (*Danaus chrysippus* (Linnaeus, 1758), *Jasius* sp.) (Bouček, 1956, and new data) and widely distributed, at least from Chad to India (Narendran, 1989). *B. kassalensis* has similar distribution and was reared from several lepidopterous pests, especially on cotton (Silvie et al., 1990). *B. boranensis* and *B. bottegi* are representatives of species distributed both in tropical Africa and Arabian Peninsula while *B. oxygastra* was previously known from the sub-Mediterranean Region. On the other hand, two species, e.g. *B. aff. laevis* and *B. aff. pilosa*, and belonging to different species groups, are vicariants of *Brachymeria* described from Central Asia. Hence the genus is quite representative of the pattern of distribution of the whole subfamily and of the relationships between traditional zoogeographic regions.

***Brachymeria albicrus* (Klug, 1834) (*femorata* species group)**

Number of specimens collected: 17. Collecting localities: Al-Ajban, Wadi Wurayah, Wadi Wurayah farm.

***Brachymeria boranensis* Masi, 1939 (*kassalensis* species group)**

Number of specimens collected: 22. Collecting localities: Wadi Bih dam, Wadi Shawkah, Wadi Wurayah farm.

***Brachymeria bottegi* Masi, 1929 (*tibialis* species group)**

Number of specimens collected: 1. Collecting locality: Al-Ajban.

***Brachymeria criculae* (Kohl, 1889) (*criculae* species group)**

Number of specimens collected: 4. Collecting locality: Al-Ajban.

***Brachymeria inermis* (Fonscolombe, 1840) (*inermis* species group)**

Number of specimens collected: 30. Collecting localities: Sharjah Desert Park, Wadi Bih dam, Wadi Safad, Wadi Shawkah, Wadi Wurayah farm.

***Brachymeria kassalensis* (Kirby, 1886) (*kassalensis* species group)**

Plates 46, 47

Number of specimens collected: 35. Collecting localities: 7 km S of al-Jazirat al-Hamra, Hatta, Sharjah, Sharjah Desert Park, Um al-Quwain, Wadi Bih, Wadi Wurayah, Wadi Wurayah farm.

***Brachymeria oxygastra* Masi, 1932 (12643) (*kassalensis* species group)**

Number of specimens collected: 1. Collecting locality: Sharjah Desert Park.

***Brachymeria persica* (Masi, 1924) (*kassalensis* species group)**

Plates 1, 10–17, 40–45

Number of specimens collected: 20. Collecting localities: Sharjah Desert Park, Wadi Wurayah, Wadi Wurayah farm.

***Brachymeria podagrica* (Fabricius, 1787) (*minuta* species group)**

Number of specimens collected: 108. Collecting localities: Al-Ajban, Fujairah, Khor al-Khwair, Sharjah, Wadi Madaq.

***Brachymeria* aff. *laevis* Nikol'skaya, 1952 (*minuta* species group)**

Number of specimens collected: 2. Collecting locality: Sharjah Desert Park.

***Brachymeria* aff. *pilosa* Nikol'skaya, 1952 (*kassalensis* species group)**

Number of specimens collected: 25. Collecting localities: Al-Ajban, Bithnah, Fujairah, S km S of al-Jazirat al-Hamra, Sharjah, Sharjah Desert Park, Wadi Bih dam, Wadi Shawkah, Wadi Wurayah.

***Brachymeria* sp. 1 (*kassalensis* species group)**

Number of specimens collected: 5. Collecting locality: Wadi Wurayah farm.

***Brachymeria* sp. 2 (*kassalensis* species group)**

Number of specimens collected: 1. Collecting locality: Wadi Wurayah farm.

***Brachymeria* sp. 3 (*rugulosa* species group)**

Number of specimens collected: 2. Collecting locality: Wadi Wurayah farm.

Subfamily **Dirhininae**

The subfamily mostly includes the cosmopolitan genus *Dirhinus*. It is easily recognisable through the presence of frontal horns (Plates 50, 51). Other characters include: Elongate and exodont mandibles (Plate 57), propodeum with subcircular to elliptic antero-median areola (Plates 52, 54), metafemur with serrulate ventral margin (Plate 56), metatibia ending as a curved spine, marginal vein of fore wing extremely long relative to the short stigmal vein and vestigial postmarginal (Plate 55); metasoma petiolate; petiole with longitudinal crests, transverse in female (Plate 53), not much longer than wide in males (Plate 54); first gastral tergite with longitudinal carinae.

The Dirhininae, as presently classified, includes 66 species worldwide, distributed within 4 genera. The subfamily is morphologically homogenous, except for the special and monotypic genus *Aplorhinus* Masi, 1924, which is certainly the sister group of the remaining Dirhininae. Most species are now included in *Dirhinus*. Nevertheless, no phylogenetic analysis of the subfamily had been carried out and this classification may be challenged: The Neotropical *Hontalia* Cameron, 1884 – downgraded to subgenus by Bouček (1992) – might be a valid genus; the same appears for *Dirhinoides* Masi, 1947, which includes *D. himalayanus* Westwood, 1836, and *D. wohlfahrtiae* Ferrière, 1935, presently classified in *Dirhinus*.

As far as is known all Dirhininae are ectoparasitoids of Diptera within the puparia of their hosts. *D. giffardii* Silvestri, 1913, has some economic importance as a parasitoid of the Mediterranean fruit fly and some *Dirhinus* were used to limit the populations of the synanthropic flies they parasitize.

Genus ***Dirhinus*** Dalman, 1818

The genus presently includes 61 species worldwide. The Indian species were revised by Bouček & Narendran (1981). The common *D. himalayanus* and *D. anthracia* Walker were collected in the UAE together with one *Dirhinus* belonging to the *ehrhorni* species group that could not be assigned to a described name. Species of that group have a tooth below the apex of the horn, visible in lateral view. *D. himalayanus* and *D. anthracia* are Indo-Pacific species but distributed (possibly introduced) respectively in the Arabian Peninsula and tropical Africa. They parasitize synanthropic flies developing on carcasses.

Dirhinus anthracia Walker, 1846 (*anthracia* species group)

Plate 51

Number of specimens collected: 29. Collecting localities: Al-Ajban, Bithnah, Hatta, Khor al-Khwair, near Mahafiz, Sharjah Desert Park, Wadi Bih dam, Wadi Madaq, Wadi Safad, Wadi Shawkah, Wadi Wurayah farm.

Dirhinus himalayanus Westwood, 1836 (*himalayanus* species group)

Plates 48, 49, 50, 52–56

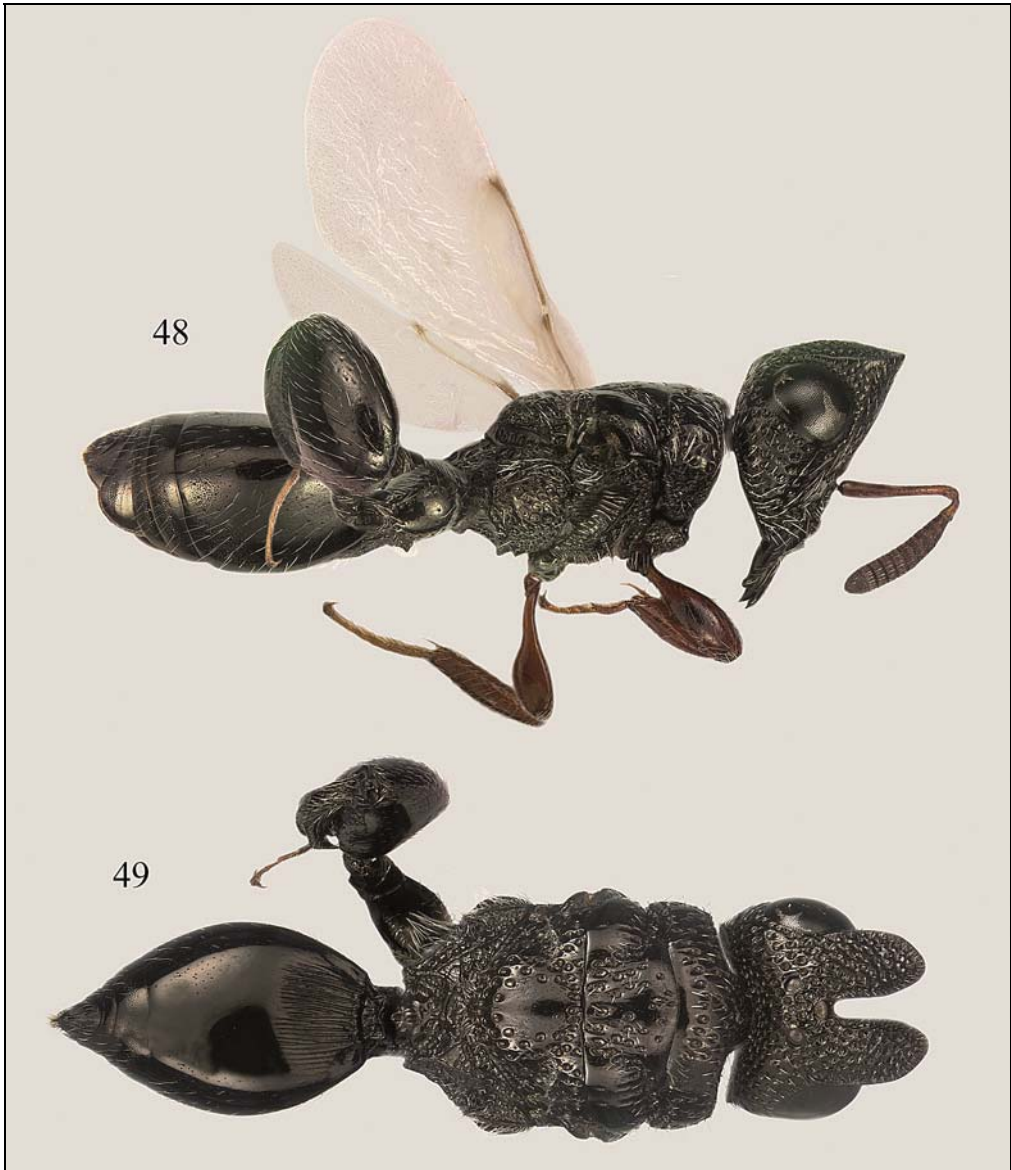
Number of specimens collected: 15. Collecting localities: Al-Ajban, Sharjah, Sharjah Desert Park, Wadi Shawkah, Wadi Wurayah, Wadi Wurayah farm.

Dirhinus* aff. *madagascariensis (Masi, 1947) (*ehrhorni* species group)

Number of specimens collected: 4. Collecting locality: Al-Ajban.

Subfamily **Epitraninae**

The subfamily includes only the palaeotropical genus *Epitranus* Walker with 63 described species. The quoted hosts are small Lepidoptera belonging to the families Tineidae, Pyralidae, and Crambidae (Narendran, 1989). Some species, such as *E. chilkaensis* (Mani, 1936) and *E. emissicius* Steffan, 1957, were mentioned as living in subterranean nests of social insects such



Plates 48–49. Habitus of *Dirhinus himalayanus* Westwood (female), respectively in lateral and dorsal view.

as Formicidae (*Camponotus*) (Narendran, 1989) and Termitidae (*Mastotermes*) (Rasplus, 1993). A few species are of economic importance as parasitoids of lepidopterous pests infesting stored products (Sauphanor et al., 1987).

The subfamily is easily recognized by the long petiole on which the gaster is inserted dorsally (Plates 57, 64). Other characters include: Antennal insertion very near oral fossa, on a protrusion (Plate 59) or, most often, on a protruding lobe of frons, masking the clypeus (Plate 66);



Plates 50–56. Characters of the genus *Dirhinus*. 50, 52, 53, 55, 56: *D. himalayanus* (Westwood) (female). 54: *Ibidem* (male). 50: Head in dorsal view; 52: Propodeum; 53: Base of metasoma; 54: Propodeum and petiole; 55: Fore wing; 56: Hind leg. 51: *D. anthracia* (Walker), female, head in dorsal view.

propodeum horizontal (Plate 61); metatibia ending as a curved spine (Plate 62); marginal vein of fore wing extremely long relative to the short stigmal vein and vestigial postmarginal (Plate 63).

Genus *Epitranus* Walker, 1834

The Oriental species were revised by Bouček (1982), the Afrotropical by Schmitz (1946) and Steffan (1957a) but these two papers dealt only with a part of the fauna, mainly that of the Congo Basin.

Two species were collected in the UAE, namely the Oriental *E. hamoni* (Risbec) (Plate 57), which includes almost all specimens of the sample, and *E. torymoides* (Risbec). This species is easily separated from *E. hamoni* by the presence of a frontal lobe (Plate 66) and the disappearance of the marginal vein on the fore wing (Plate 67).

Epitranus hamoni (Risbec, 1957)

Plates 57–64

Number of specimens collected: 87. Collecting localities: Al-Ajban, Bithnah, Hatta, Jebel Hafit, near Mahafiz, Sharjah, Sharjah Desert Park, Wadi Bih dam, Wadi Hayl, Wadi Safad, Wadi Shawkah, Wadi Wurayah farm.

Epitranus torymoides (Risbec, 1953) [comb. nov.]

Plates 65–67

Number of specimens collected: 3. Collecting localities: Wadi Bi dam, Wadi Hayl, Wadi Shawkah.

Subfamily **Haltichellinae**

This is by far the most diverse subfamily found in the Arabian Peninsula and the Old World. It includes over 500 described species. The morphology is also much more various than in the other subfamilies. The Haltichellinae can be mostly recognised from the other Chalcididae by the apex of the metatibia, which is truncate at right angle and bears two spurs (Plates 24, 90). Another important, less visible, character is the habitus of the axillulae. In most other chalcid wasps they are visible as small lateral and sloping surfaces on the sides of the scutellum, separated from it by a longitudinal groove. In Haltichellinae they form somewhat raised plates which are dorsally carinate (Plates 22, 23). Furthermore the anterior angle of these plates faces a tooth which projects posteriorly from the axillae (Plates 109, 149). This character state is quite evident in the genus *Belaspidia* (Plate 71). Finally, the petiole of Haltichellinae has a special structure: A flange originating from its main body abuts on the margin of the petiolar foramen of the propodeum (Steffan, 1957b).

The Haltichellinae are mostly parasitoids of Lepidoptera but *Lasiochalcidia* and *Hybothorax* were repeatedly reared from antrions, one species of *Neohybothorax* Nikol'skaya, 1960, was quoted from Ascalaphidae and *Proconura caryobori* in a parasitoid of bruchid beetles in stored products. Lastly, *Hockeria mengenillarum* (Silvestri) was reared from Strepsiptera of the genus *Mengenilla* (Silvestri, 1943).

Genus *Belaspidia* Masi, 1916

The genus is Holarctic in distribution with one species described from California and the rest in Europe and the Mediterranean Basin. The Palearctic species were revised by Delvare et al. (1999). The genus presently includes 7 valid species but, according to samples recently examined, 3 species respectively from Jordan and the UAE are undescribed. These chalcid wasps are parasitic of small Lepidoptera such as Gelechiidae (Antoni Ribes, pers. comm.), Psychidae and Choreutidae.



Plate 57. Habitus of *Epitranus hamoni* (Risbec) (male), in lateral view.

Belaspidia can be recognized by its subtrapezoidal clypeus (Plates 68, 69), interantennal projection reduced to a bump, axillar grooves appearing as holes, because of the protruding carina tooth on the axillae and anterior projection of the axillulae (Plate 71), absence of frenal and frenal area on the scutellum which conversely shows a median tooth at the apex (Plate 71), absence of epicnemial carina and epicnemium on mesepisternum, ecarinate procoxa, relatively long stigmal and postmarginal veins (Plate 72). These original characters isolate *Belaspidia* within the Haltichellinae.

Belaspidia* aff. *obscura Masi, 1916

Plates 68–73

Number of specimens collected: 2. Collecting localities: Wadi Madaq, Wadi Shawkah.

Belaspidia* aff. *tussaci Delvare, 1999

Number of specimens collected: 1. Collecting locality: Wadi Madaq.

The ***Rhynchochalcis*** genus group

Rhynchochalcis belongs to a special genus group which otherwise includes *Anachalcis* Steffan, 1951, and *Aphasganophora* Nikol'skaya, 1952. They share the following characters: long genae, subtrapezoidal clypeus with antennal insertion distant from its dorsal margin (Plates 74, 75), prominent and discoid interantennal projection, scutellum with a frenal carina delimiting anteriorly a reflexed frenal area (Plate 77), sharp tooth on each side of the propodeum near spiracle (Plates 76, 78), absence of additional carina on the outer side of the metatibia (Plate 77), postmarginal vein much longer than stigmal (Plate 77).



Plates 58–67. Characters of the genus *Epitranus*. 58–63: *E. hamoni* (Risbec) (male); 64: Idem (female). 58: Head in frontal view; 59: Lower face; 60: Habitus in dorsal view; 61: Propodeum and petiole; 62: Metafemur and tibia; 63: Fore wing; 64: Metasoma. 65–67: *E. torymoides* (Risbec) (female). 65: Head in frontal view; 66: Lower face; 67: Fore wing.

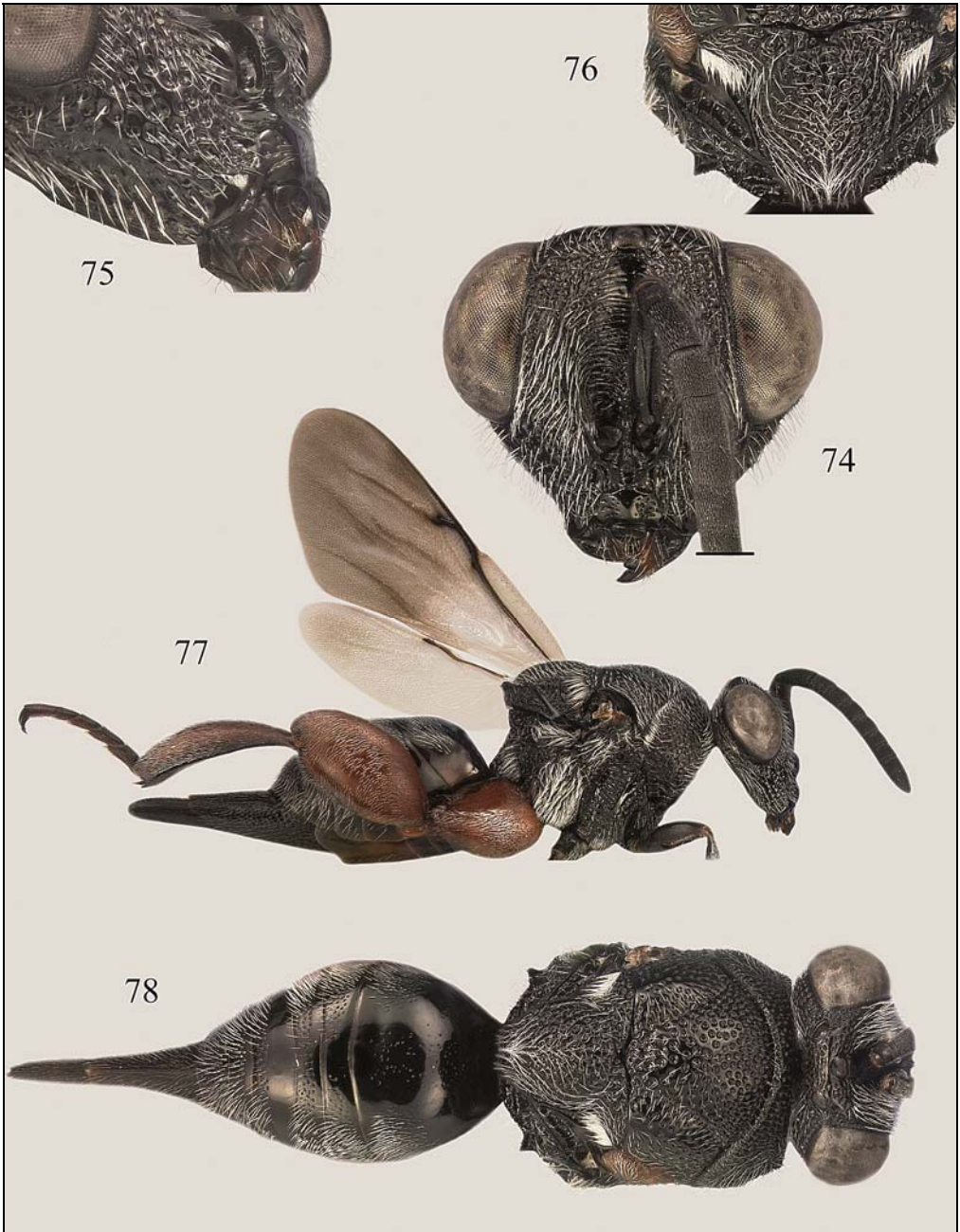


Plates 68–73. Characters of the genus *Belaspidia*. *B. aff. obscura* Masi (female). 68: Head in frontal view; 69: Lower face; 70: Mesosoma in dorsal view; 71: Scutellum in dorsal view; 72: Fore wing; 73: Hind leg.

Genus *Rhynchochalcis* Cameron, 1905

Rhynchochalcis probably is the sister group of *Aphasganophora* and shares with it an unique derived state on the axillae, which are truncate posteriorly, the vertical truncation being carinate above and thickly pilose (Plate 76). *Rhynchochalcis* itself is recognized by a narrow oral fossa and long genae which generally have a concave outline when seen in frontal view; the frons shows a blunt horseshoe-like carina as in *Antrocephalus*. The single species of *Rhynchochalcis* collected in UAE is relatively different from the described ones: the genae are shorter (Plate 74), the horseshoe carina on the frons is vestigial, the fore wing of the female is entirely bare at base (Plate 77) while the membrane and setation of the male are completely white.

The genus actually includes 9 palaeotropical species. The single species collected in the UAE is close to *R. pruinosa* Cameron, described from Pakistan. Only the host of *R. thresiae* Narendran, 1989, is known, belonging to the family Psychidae.



Plates 74–78. Characters of the genus *Rhynchochalcis*. *R. aff. pruinosa* Cameron (female). 74: Head in frontal view; 75: Lower half of head in latero-ventral view; 76: Scutellum in dorsal view; 77, 78: Habitus respectively in lateral and dorsal view.



Plates 79–84. Characters of the genus *Eualcicis*. *E. afra* (Masi) (female). 79: Fore wing; 80: Fore wing venation; 81: Venation enlarged; 82: Hind leg; 83: Metacoxa; 84: Metatibia.

***Rhynchochalcis* aff. *pruinosa* Cameron, 1906**

Plates 74–78

Number of specimens collected: 2. Collecting locality: Wadi Shawkah, Wadi Wurayah.

The *Haltichella* genus group

The set especially includes the genera *Eualcicis*, *Hockeria*, *Haltichella*, *Kriechbaumerella*, *Antrocephalus* and *Oxycoryphe* and contains a significant part of the species belonging to the Haltichellinae. Here the clypeus is moderately to evidently reflexed and carinate dorsally, the antennae are inserted close to its dorsal margin and the interantennal projection is strongly prominent and discoid (Plates 86, 87, 107, 113, 115).

Genus *Eualcicis* Dufour, 1861

The present concept of the genus is somewhat different from that retained by the authors. *Eualcicis* often has contrasted surfaces on the fore wing – hyaline or more or less infumate – but all hyaline areas bear dark setae (Plate 80); in addition the postmarginal vein is much longer than the stigmal (Plate 81) and the metatibia has an additional carina on the outer side (Plate 84). These characters are exhibited by the type species of the genus, *E. miegii* Dufour,

1861. According to these characters, a number of species presently classified in *Hockeria* must be transferred to *Euchalcis*:

Euchalcis exlex (Nikol'skaya, 1952) **comb. nov.** from *Stomatoceras*

Euchalcis inopinata (Bouček, 1952) **comb. nov.** from *Hockeria*

Euchalcis magna (Bouček, 1952) **comb. nov.** from *Hockeria*

Euchalcis susterai (Bouček, 1952) **comb. nov.** from *Hockeria*

Only one female of *E. afra* (Masi) was collected from the UAE. This species is unique in having the base of the metacoxa densely setose (Plate 83). The membrane of the fore wing has quite contrasted white and infumate areas (Plate 79) but the spot surrounding the stigmal vein bears slightly obscured setae (Plate 80). The species was described from Libya but is distributed to the South as far as Mauritania. It is a rare and small *Euchalcis* and the male is unknown.

Euchalcis afra (Masi, 1932) **comb. nov.** from *Hockeria*

Plates 79–84

Number of specimens collected: 1. Collecting locality: Sharjah Desert Park.

Genus *Hockeria*

The genus is mostly distributed in the Old World with 86 described species, 15 of them having been otherwise described from the Americas. The Oriental and European species were revised respectively by Narendran (1989) and Bouček (1982). Further species were described, mainly from Central Asia by Nikol'skaya (1952, 1960). The main hosts are Lepidoptera belonging to various families, but a few *Hockeria* were reared in tropical Africa from Glossinidae; *H. bicolor* Halstead, 1990 – morphologically quite different from the rest of the species – was quoted from antlions and ascalaphids in the USA and *H. menginillarum* (Silvestri, 1943) from Strepsiptera.

The present concept of the genus is somewhat different from that retained by the authors (see above under the genus *Euchalcis*). *Hockeria* is limited here to species showing contrasted – white and infumate – surfaces on the membrane of the fore wing, with at least part of the hyaline areas bearing white setation (Plates 91, 92, 97, 105). In addition, the postmarginal vein is almost always short, not or hardly as long as the stigmal, and the metatibia has no additional carina.

The *Hockeria* collected in the UAE exhibit various morphologies. One species, close to *H. menginillarum*, has a sulcate interantennal projection and the postmarginal vein is distinctly longer than the stigmal (Plate 98); the globose head (Plate 95) and very densely punctured mesonotum (Plate 96) are other special characters which, together with the particular hosts – Strepsiptera of the genus *Mengenilla* Hofeneder, 1910 – suggest that the group might deserve a distinct generic placement. Another species has the membrane of the fore wing entirely white and bearing white setation (Plate 99); in addition the marginal vein is slightly removed from the front margin of the wing and the postmarginal absent (Plate 100). The serrulate margin of the metafemur in a third species is similar to that of *Kriechbaumerella* (Plate 102). A further species, belonging to the *singularis* species group, shows a gap in this serrulation of the metafemur (Plate 103). Hence, the *Hockeria* collected in the UAE are quite diverse for such a reduced territory with 10 collected species, 9 of them being undescribed. In addition, it shows evident affinities with various zoogeographic regions such as Sahara, Mediterranean Basin, Central Asia and India. This validates the partition of the zoogeographic regions recently proposed by Holt et al. (2013).



Plates 85–93. Characters of the genus *Hockeria*. *H. metula* (Nikol'skaya) (female). 85: Head in frontal view; 86: Lower face; 87: Lower half of head in latero-ventral view; 88: Scutellum in lateral view; 89: Hind leg; 90: Apex of metatibia; 91: Fore wing; 92: Fore wing venation; 93: Habitus in dorsal view.



Plate 94. Habitus of the *Hockeria metula* (Nikol'skaya) (female), in lateral view.

Hockeria metula (Nikol'skaya, 1952) [*bifasciata* species group]

Plates 85–94

Number of specimens collected: 38. Collecting localities: N of Ajman, al-Ajban, Jebel Jibir, Wadi Bih dam, Wadi Shawkah, Wadi Wurayah, Wadi Wurayah farm.

Hockeria* sp. 1 aff. *anupama Narendran, 1989 [*anupama* species group]

Plates 99–101

Number of specimens collected: 24. Collecting locality: Al-Ajban.

Hockeria* sp. 2 aff. *apani Doganlar, 1990 [*singularis* species group]

Plate 103

Number of specimens collected: 7. Collecting localities: Al-Ajban, Hatta, Sharjah Desert Park, Wadi Shawkah, Wadi Wurayah farm.

Hockeria* sp. 3 aff. *argentigera Holmgren, 1868 [*tamaricis* species group]

Number of specimens collected: 4. Collecting localities: al-Ajban, near Mahafiz, Wadi Madaq.



Plates 95–105. 95–98: *Hockeria* aff. *mengenillarum* (Silvestri) (female). 95: Head in dorsal view; 96: Mesosoma; 97: Fore wing; 98: Fore wing venation. 99–101: *H.* aff. *anupama* Narendran (male). 99: Fore wing; 100: Fore wing venation; 101: Hind leg. 102: *H.* aff. *grisselli* Narendran (female), hind leg. 103: *H.* aff. *apani* Doganlar (female), idem. 104: *H.* aff. *tamaricis* Bouček (female), metasoma in dorsal view. 105: *H.* aff. *gibsoni* Narendran (female), fore wing.

Hockeria* sp. 4 aff. *gibsoni Narendran, 1989 [*liberator* species group] Plate 105
 Number of specimens collected: 17. Collecting localities: Al-Ajban, Um al-Quwain, Wadi Safad.

Hockeria* sp. 5 aff. *grisselli Narendran, 1989 [*liberator* species group] Plate 102
 Number of specimens collected: 29. Collecting localities: N of Ajman, Sharjah, Wadi Bih dam, Wadi Shawkah, Wadi Wurayah farm.

Hockeria* sp. 6 aff. *mengenillarum Silvestri, 1943 [*mengenillarum* species group] Plates 95–97
 Number of specimens collected: 5. Collecting localities: Wadi Bih dam, Wadi Madaq, Wadi Wurayah, Wadi Wurayah farm.

Hockeria* sp. 7 aff. *tamaricis Bouček, 1982 [*tamaricis* species group] Plate 104
 Number of specimens collected: 2. Collecting locality: Al-Ajban.

***Hockeria* sp. 8** [*bifasciata* species group]
 Number of specimens collected: 1. Collecting locality: Al-Ajban.

***Hockeria* sp. 9** [*liberator* species group]
 Number of specimens collected: 16. Collecting locality: Al-Ajban.

***Hockeria* sp. 10** [*tamaricis* species group]
 Number of specimens collected: 2. Collecting localities: N of Ajman, ar-Rafah.

Genus ***Kriechbaumerella*** Dalla Torre, 1897

The genus is only distributed in the Old World and includes 25 valid species but many more await description, especially in tropical Africa. Only the Oriental species were recently revised (Narendran, 1989). The known hosts belong to families mostly of large moths such as Limacodidae, Lasiocampidae and Saturniidae.

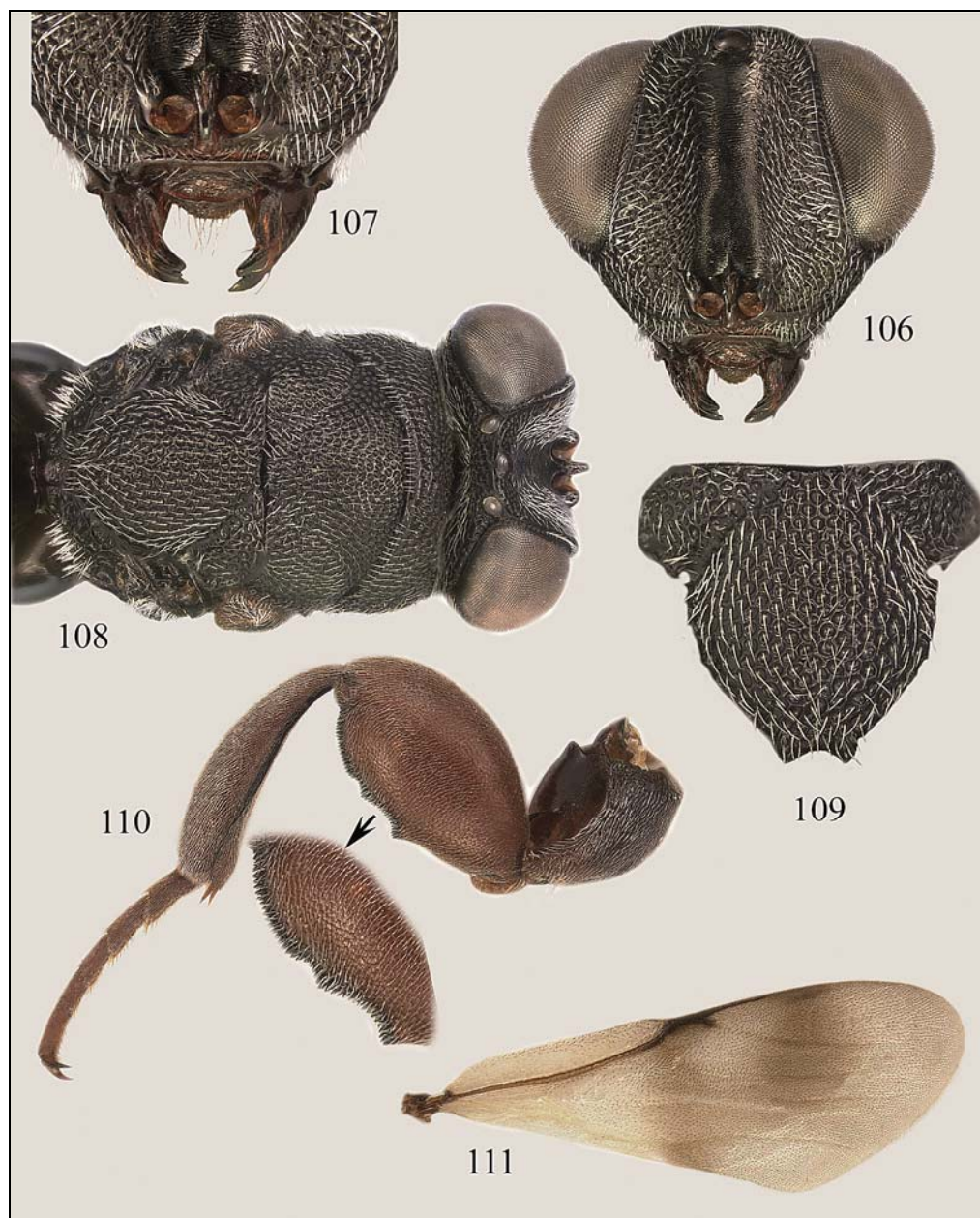
Within the above set of genera quoted above, *Kriechbaumerella* is defined by the following characters: head with horseshoe-like carina and frons with deep and wide scrobal depression; pronotal carina restricted to sides, not visible on dorsum of pronotum (Plate 108); scutellum ending as submedian lobes (Plate 109) which sometimes form projecting teeth separated by a deep incision; serrulate margin of metafemur forming 3 lobes (Plate 110); membrane of fore wing sometimes with infumate and hyaline spots or bands but always bearing dark setation, at least from base of basal vein; postmarginal vein much longer than stigmal (Plate 111).

Only one species was collected in the UAE, identified here as *K. destructor* (Waterston, 1922) when using the diagnosis and key provided by Narendran (1989). The species was reared in India from pyralid moths belonging to the genus *Hypsipyla* Ragonot, 1888.

Kriechbaumerella destructor (Waterston, 1922) Plates 24, 106–111
 Number of specimens collected: 3. Collecting locality: Wadi Wurayah, Wadi Wurayah farm.

Genus ***Antrocephalus*** Kirby, 1883

The genus is restricted to the Old World with 117 species described, half of them originating from Australia. Only the Oriental species were recently revised (Narendran, 1989). The known hosts are Lepidoptera belonging to the families Tortricidae, Oecophoridae, Pyralidae and Crambidae. Some species are beneficial as parasitoids of phyllophagous moths infesting the coconut palm; others are found in the stored products and then may also be parasitoids of bruchid beetles.



Plates 106–111. Characters of the genus *Kriechbaumerella*. *K. destructor* (Waterston) (female). 106: Head in frontal view; 107: Lower face; 108: Head and mesosoma in dorsal view; 109: Scutellum in dorsal view; 110: Hind leg; 111: Fore wing.



Plates 112–120. Characters of the genus *Antrocephalus*. 112–117: *A. cameroni* n. n. (female). 112: Head in frontal view; 113: Lower half of head in latero-ventral view; 114: Head in dorsal view; 115: Lower face; 116: Hind leg; 117: Fore wing. 118–120: *A. subelongatus* (Kohl). 118: Head and mesosoma in dorsal view; 119: Pronotum; 120: Hind leg.

Antrocephalus is close to *Kriechbaumerella* and differs from it by the following characters: Pronotal carinae directed toward the posterior margin of the pronotum where they often form submedian protrusions (Plate 119); lobes of the frenal carina generally less expanded (Plate 118), serrulate margin of metafemur wavy (Plate 120), at most with a small tooth at mid length (Plate 116).

Nine species were collected in the UAE, two of which could be assigned with certainty to published names. More precise identifications would need the examination of the types of the numerous species described from the Oriental and Afrotropical regions. *A. brevidentata* Roy & Farooqi, described from India is widely distributed as the author examined specimens from Spain, Morocco, Arabian Peninsula and South Africa. In the sample collected from the UAE, *A. subelongatus* (Kohl) figures as the commonest species.

***Antrocephalus cameroni* n. n.**

Plates 3, 112–117

Number of specimens collected: 26. Collecting localities: Al-Ajban, Bithnah, Hatta, Sharjah Desert Park, Wadi Bih dam, Wadi Madaq, Wadi Safad, Wadi Shawkah, Wadi Wurayah.

This species was described as *Stomatoceras rufipes* Cameron, 1907, preoccupied by *Antrocephalus rufipes* Cameron, 1905. Therefore a new name is proposed here.

***Antrocephalus subelongatus* (Kohl, 1906)**

Plates 118–120

Number of specimens collected: 94. Collecting localities: Al-Ajban, N of Ajman, Fujairah, Wadi Madaq, Wadi Shawkah, Wadi Wurayah, Wadi Wurayah farm.

***Antrocephalus ?dividens* (Walker, 1860)**

Number of specimens collected: 1. Collecting locality: Bithnah.

***Antrocephalus* sp. 1 aff. *subelongatus* (Kohl)**

Number of specimens collected: 5. Collecting localities: Sharjah Desert Park, Wadi Shawkah.

***Antrocephalus* sp. 2 aff. *subelongatus* (Kohl)**

Number of specimens collected: 4. Collecting localities: Fujairah, near Mahafiz.

***Antrocephalus* sp. 3 aff. *subelongatus* (Kohl)**

Number of specimens collected: 7. Collecting localities: Sharjah Desert Park, Wadi Bih dam, Wadi Safad, Wadi Shawkah, Wadi Wurayah farm.

***Antrocephalus* sp. 4 aff. *brevigaster* Masi, 1932**

Number of specimens collected: 1. Collecting locality: N of Ajman.

***Antrocephalus* sp. 5 aff. *brevigaster* Masi, 1932**

Number of specimens collected: 18. Collecting localities: N of Ajman, Hatta, near Mahafiz, Sharjah, Sharjah Desert Park, Wadi Madaq, Wadi Wurayah farm.

***Antrocephalus* sp. 6 aff. *brevigaster* Masi, 1932**

Number of specimens collected: 1. Collecting locality: Near Mahafiz.

The *Hybothorax* genus group

This set of genera was early distinguished through the special venation of the fore wing: marginal vein somewhat removed from the front margin of the wing and postmarginal vein absent (Plates 127, 142, 153, 160, 165). Anyway these characters are homoplastic as found in some other species belonging to other lineages, such as a few species of *Hockeria* and

Hastius ochraceus Schmitz, 1946. The *Hybothorax* group shows a uniquely derived character: a triangular lamina originates from the prosternum. In addition the median tooth present in most other Halticellinae, and originating ventrally from the prepectus, is here absent.

Genus *Lasiochalcidia* Masi, 1929

The genus presently includes 20 valid species described respectively from the Afrotropical, Oriental and Palaearctic regions. All hosts quoted in the literature are ant lions. Steffan (1958b, 1959c, 1959d, 1961, 1966) in a series of nice papers studied their biology and oviposition behaviour. The females, conversely to other parasitoids, do not use chemical cues to localise their hosts, but movements of the sand or dust made by ant lion larvae as these ones are underground and hidden. Once a host is detected the activity of the female greatly increases while the ant lion tries to escape parasitization by still deeper burying itself. The strategy of the female *Lasiochalcidia* then differs according to her morphology. Females with slender legs – belonging to the *guineensis* species group (Plate 130) – just outspread them and slide within the sand until they find their host. In the *pubescens* species group, the enlarged apical lobe on the metafemur (Plate 125) prevents the female from being seized by the forceps of the ant lion through obstructing them between their metafemur and tibia. Species belonging to the *dargelasii* species group (Plate 129) fall on the side while grasping the ant lion larvae with their legs.

Lasiochalcidia can be recognized mainly through the mandibular formula: both mandibles are identical and 3-toothed (Plate 122). Otherwise the body has outstanding setation (Plates 121, 124, 128), the head is quite transverse in dorsal view with antennal scrobes not or hardly impressed (Plate 128), the scutellum ends into submedian or median lobes turned upward (Plate 124), the propodeum is sloping and most often shows lateral teeth.

The *Lasiochalcidia* collected in the UAE belong to the three species groups quoted above but *L. pubescens* (Klug) is by far the commonest species. A single female, belonging to an undescribed species of the *guineensis* group, was found.

Lasiochalcidia cincticornis (Walker, 1871) [*dargelasii* species group]

Number of specimens collected: 2. Collecting locality: Um al-Quwain.

Lasiochalcidia pubescens (Klug, 1834) [*pubescens* species group] Plates 18–21, 121–128

Number of specimens collected: 38. Collecting localities: Al-Ajban, Sharjah, Sharjah Desert Park, Um al-Quwain, Wadi Bih dam, Wadi Madaq.

Lasiochalcidia sp. 1 aff. *cincticornis* (Walker, 1871) [*dargelasii* species group]

Number of specimens collected: 5. Collecting localities: Al-Ajban, near Mahafiz.

Lasiochalcidia sp. 2 aff. *cincticornis* (Walker, 1871) [*dargelasii* species group]

Number of specimens collected: 2. Collecting localities: S of Ra's al-Khaimah, Um al-Quwain.

Lasiochalcidia sp. 3 [*guineensis* species group]

Number of specimens collected: 1. Collecting locality: Wadi Bih dam.

Genus *Indoinvraia* Roy & Farooqi, 1984

The genus is known from India and presently includes 2 described species. It is characterised by the large area of micropilosity of the female antenna, which reaches the base of the clava (Plate 134). The head is triangular with narrow oral fossa and long genae (Plate 132). The



Plates 121–128. Characters of the genus *Lasiochalcidia*: *L. pubescens* (Klug). 121: Head in frontal view; 122: Lower face; 123, 124: Scutellum, respectively in dorsal and lateral view; 125: Hind leg; 126: Fore wing; 127: Fore wing venation; 128: Habitus in dorsal view.



Plates 129–130. Characters of the genus *Lasiochalcidia*. Hind leg of females, respectively belonging to the *dargelasii* (129) and *guineensis* species groups (130).

single species collected in the UAE is furthermore easily recognized by the pattern of colouration of the female (Plates 131, 138), the strongly bilobed scutellum (Plate 135) and the presence of sharp postero-lateral teeth on the propodeum (Plate 136). An extremely close, probably vicariant, species lives in South Africa. *I. bouceki* Roy & Farooqi, 1984, described from India, is somewhat different as it lacks, according to the original description, the propodeal teeth exhibited by the species from the UAE.

***Indoinvrea* sp.**

Plates 4, 5, 131–144

Number of specimens collected: 39. Collecting localities: Sharjah Desert Park, Wadi Bih dam, Wadi Shawkah, Wadi Wurayah farm.

Genus *Bucekia* Steffan, 1951

Only 4 species are described, all from the Palaearctic region but *B. differens* was recorded from Senegal by Steffan (1951b) and the author can confirm its presence in tropical Africa. No precise host is quoted from literature but Nikol'skaya (1960) mentioned an unidentified Phycitinae (Pyralidae). Species of *Bucekia* are found in dried or desert places where the vegetation is sparse.

Within the *Hybothorax* group the females of *Bucekia* are easily recognized by the presence of a dorsal areola at the apex of the metatibia, delimited by a subelliptic raised carina (Plate 148). The males are less easily identified as the areola is here vestigial (Plate 152). In addition the mesofemur and tibia bear very long setae (Plates 146, 151). The metafemur at its base and on dorsal margin also show long hairs (Plate 147). Otherwise the habitus of *Bucekia* is somewhat similar to *Lasiochalcidia* especially the setation on the body, which in some places, such as lower frons, hides the integument.

***Bucekia differens* (Bouček, 1949)**

Plates 145–153

Number of specimens collected: 61. Collecting localities: Sharjah, Wadi Bih dam, Wadi Madaq, Wadi Safad, Wadi Shawkah, Wadi Wurayah.



Plate 131. Habitus of *Indoinvrea* aff. *bouceki* Roy & Farooqi (female), in lateral view.

Bucekia dissimilis Nikol'skaya, 1960

Number of specimens collected: 2. Collecting locality: Al-Ajban.

Genus ***Psilochalcis*** Kieffer, 1905

- = *Euchalcidiella* Masi, 1929. Type species *Euchalcidiella bardiensis* Masi, 1929, by monotypy. **Syn. nov.**
- = *Psilochalcidia* Steffan, 1951. Type species *Psilochalcidia dentata* Steffan, 1951, by monotypy. **Syn. nov.**
- = *Cephalochalcidia* Nikol'skaya, 1960. Type species *Cephalochalcidia capitata* Nikol'skaya, 1960, by original designation. **Syn. nov.**

The genus is mostly distributed in the Old World with 51 described species, 4 of them having been otherwise described from California (USA). It is most often found in drier habitats with cleared vegetation, where it is possible to collect specimens by sweeping very near the ground. The known hosts belong to the families Oecophoridae, Pyralidae and Crambidae. The available literature provides only pests as hosts: cereal stems borers are parasitized by *P. soudanensis* (Steffan, 1951) and *P. ghanii* (Habu, 1970) respectively in tropical Africa and Pakistan; *P. ceratoniae* Delvare was reared in Iran from the carob moth (Delvare et al., 2011). The genus is morphologically quite variable and was described a number of times respectively as *Leptochalcis* Kieffer, 1905, *Invreia* Masi, 1929, *Euchalcidia* Masi, 1929,



Plate 132–138. Characters of the genus *Indoinvraia*. *I.* aff. *bouceki* Roy & Farooqi (female). 132: Head in frontal view; 133: Lower half of head in latero-ventral view; 134: Clava in ventral view; 135: Scutellum in dorsal view; 136: Propodeum in latero-dorsal view; 137: Fore wing; 138: Habitus in dorsal view.



Plates 139–143. *Indoinvrea* aff. *bouceki* Roy & Farooqi (male). 139, 140: Scutellum respectively in dorsal and lateral view; 141: Fore wing; 142: Fore wing venation; 143: Hind leg; 144: Meso- and metasoma in dorsal view.

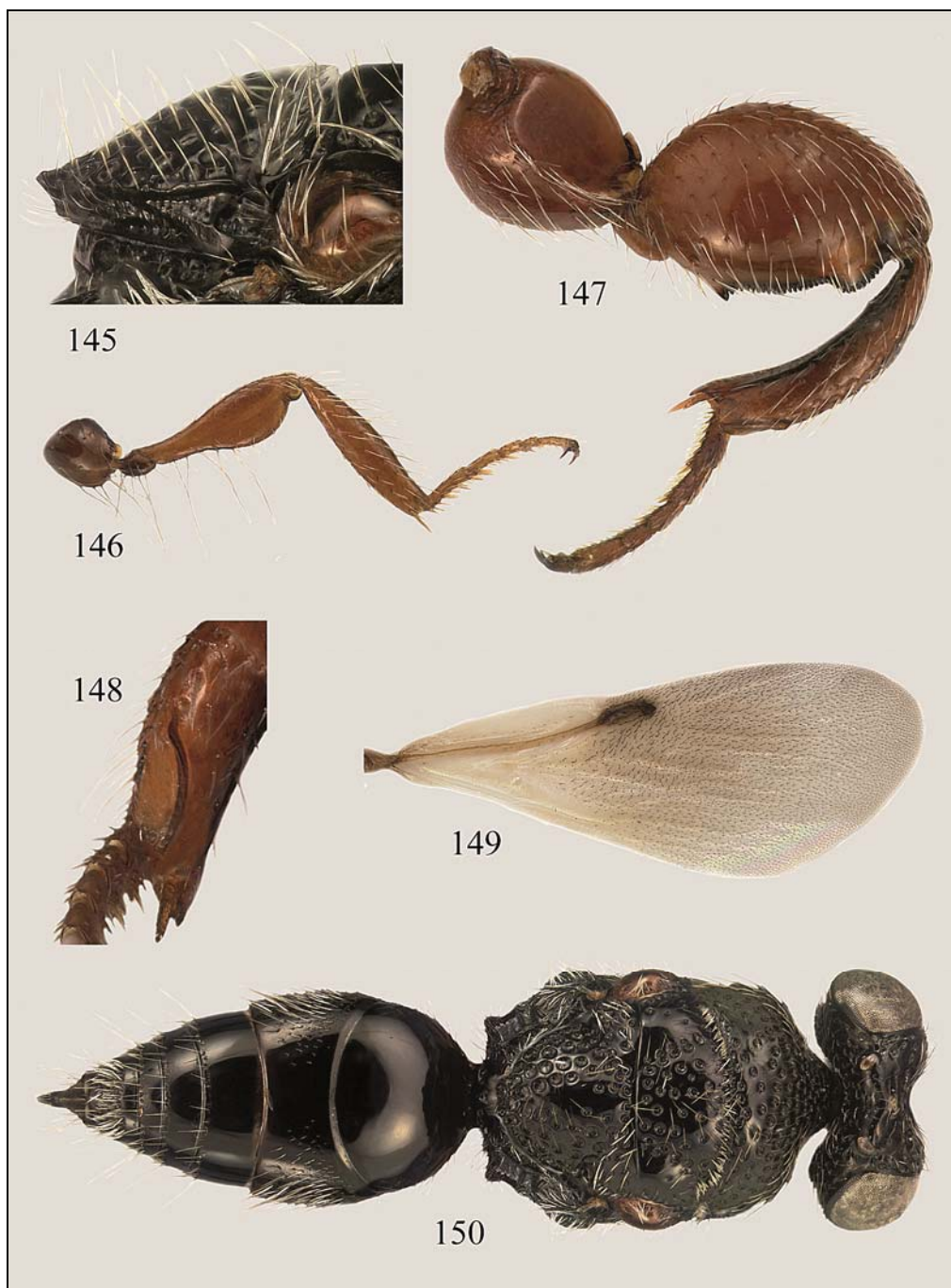
Peltochalcidia Steffan, 1948, and *Hyperchalcidia* Steffan, 1951 (Bouček, 1992). All primary types figuring the type species of these genera were examined by the author. *Euchalcidia* was, for some time, misidentified with the genus presently known as *Proconura* Girault. *Peltochalcidia* was described for species having a lamina overhanging the mouth margin and formed by the expansion of the clypeus being here reflexed (Plate 163). *Hyperchalcidia soudanensis*, the type species of the genus, has an unusually elongate body with massive

head, characters that are retrieved in *Euchalcidiella* Masi, 1929, and *Cephalochalcidia* Nikol'skaya, 1960 (Plate 161). *Psilochalcis longigena* Kieffer, 1905, the type species of the genus, has a somewhat sloping propodeum ornamented with lateral teeth, an enlarged basal tooth on the metafemur, which is formed by a swelling of the serrulation. *Psilochalcidia dentata* Steffan, 1951, exhibits the same characters (Plates 151, 152), but, in addition, its scutellum ends as two submedian protrusions (Plate 155). *Invreia subaenea* Masi, 1929, the type species of the genus, has a normal basal tooth on the metafemur, mostly horizontal and unarmed propodeum, the posterior margin of the scutellum rounded and unarmed. Nevertheless, other species, such as *Invreia nigerrima* Masi, 1929, show a combination of the characters found in the type species of *Psilochalcis*, *Psilochalcidia* and *Invreia*. All states between typical *Psilochalcis* and *Peltochalcidia* were also found. Finally, species with globose head and elongate body do not differ much from forms initially described as *Peltochalcidia* except for the absence of frontal lamina or lobe.

The examination of most of the primary types of the genera mentioned above allowed establishment of the following new combinations:

- Psilochalcis adversa* (Nicol'skaya, 1960) **comb. nov.** from *Invreia*
Psilochalcis aspera (Steffan, 1951) **comb. nov.** from *Peltochalcidia* and **stat. rev.**
Psilochalcis bardiensis (Masi, 1929) **comb. nov.** from *Euchalcidiella*
Psilochalcis capensis (Steffan, 1948) **comb. nov.** from *Peltochalcidia*
Psilochalcis caspica (Nicol'skaya, 1960) **comb. nov.** from *Invreia*
Psilochalcis capitata (Nicol'skaya, 1960) **comb. nov.** from *Cephalochalcidia*
Psilochalcis clypeata (Bouček, 1952) **comb. nov.** from *Peltochalcidia*
Psilochalcis crassicornis (Masi, 1929) **comb. nov.** from *Invreia*
Psilochalcis distincta (Nicol'skaya, 1960) **comb. nov.** from *Invreia*
Psilochalcis elegantula (Masi, 1929) **comb. nov.** from *Euchalcidia*
Psilochalcis ferrierei (Steffan, 1948) **comb. nov.** from *Peltochalcidia* and **stat. rev.**
Psilochalcis hirtella (Masi, 1943) **comb. nov.** from *Invreia*
Psilochalcis israelica (Bouček, 1956) **comb. nov.** from *Invreia*
Psilochalcis ligustica (Masi, 1929) **comb. nov.** from *Invreia*
Psilochalcis mirabilis (Bouček, 1952) **comb. nov.** from *Invreia*
Psilochalcis miranda (Nicol'skaya, 1960) **comb. n.** from *Invreia*
Psilochalcis nitens (Steffan, 1948) **comb. nov.** from *Peltochalcidia*
Psilochalcis nitida (Bouček, 1952) **comb. nov.** from *Invreia*
Psilochalcis novitzkyi (Bouček, 1956) **comb. nov.** from *Invreia*
Psilochalcis popovi (Nicol'skaya & Kyao, 1954) **comb. nov.** from *Peltochalcidia*
Psilochalcis schoutedeni (Steffan, 1954) **comb. nov.** from *Peltochalcidia*
Psilochalcis senegalensis (Steffan, 1951) **comb. nov.** from *Peltochalcidia*
Psilochalcis shestakovi (Nicol'skaya, 1960) **comb. nov.** from *Peltochalcidia*
Psilochalcis subaenea (Masi, 1929) **comb. nov.** from *Invreia*
Psilochalcis subdola (Nicol'skaya, 1960) **comb. nov.** from *Invreia*
Psilochalcis subita (Nicol'skaya, 1960) **comb. nov.** from *Invreia*
Psilochalcis subjecta (Nicol'skaya, 1960) **comb. nov.** from *Invreia*
Psilochalcis subtilis (Nicol'skaya, 1960) **comb. nov.** from *Invreia*
Psilochalcis tadzhika (Nicol'skaya, 1960) **comb. nov.** from *Peltochalcidia*
Psilochalcis benoisti (Steffan, 1948) **comb. nov.** from *Peltochalcidia*

Peltochalcidia ferrierei Steffan, 1948, was synonymized with *P. benoisti* Steffan, 1948, by Steffan himself (1951b). The examination of their respective holotypes showed that they



Plates 145–150. Characters of the genus *Bucekia*. *B. differens* (Bouček) (female). 145: Scutellum in lateral view; 146: Mid leg; 147: Hind leg; 148: Apex of metatibia; 149: Fore wing; 150: Habitus in dorsal view.



Plate 151–153: *Bucekia differens* (Bouček) (male). 151: Mid leg; 152: Apex of metatibia; 153: Fore wing venation.

belong to close, but different species. In addition the examination of a female of *Peltochalcidia oranensis* Bouček, 1952, identified by the author himself, revealed that this name is a synonym of *P. benoisti* [**syn. nov.**] Examination of the type of *Peltochalcidia nitens* Steffan, 1948, confirms the validity of the species (see Steffan, 1953). The type of *Peltochalcidia aspera* Steffan, 1951, could not be found. The short original description (Steffan, 1951a) mentions a moderately protruding clypeus for that genus and the surface of the metafemur being alutaceous. The author found a female from Morocco which exactly fits these states. The name was subsequently synonymized with *P. subaenea* (Masi, 1929) by Steffan himself (1953) certainly because both species share a short, triangular fronto-clypeal lamina. Nevertheless, the species are different: *P. subaenea* shows an additional carina on the outer side of the metatibia – absent in *P. aspera* – and the metafemur has sparse piliferous points only.

Psilochalcis immaculata (Rossi, 1792) is a senior synonym of *Invreia nigerrima* Masi, 1929 [**syn. nov.**].

Not less than 12 species were collected in the UAE representing the whole range of variation encountered in the genus and described above. In addition, a number of small species close to *Psilochalcis nitida* (Bouček, 1952) were found. Here, the head is subtriangular with narrow oral fossa and long malar space, the mesonotum is sparsely and superficially punctured, the scutellum convex, the legs and gaster often partly to entirely reddish.

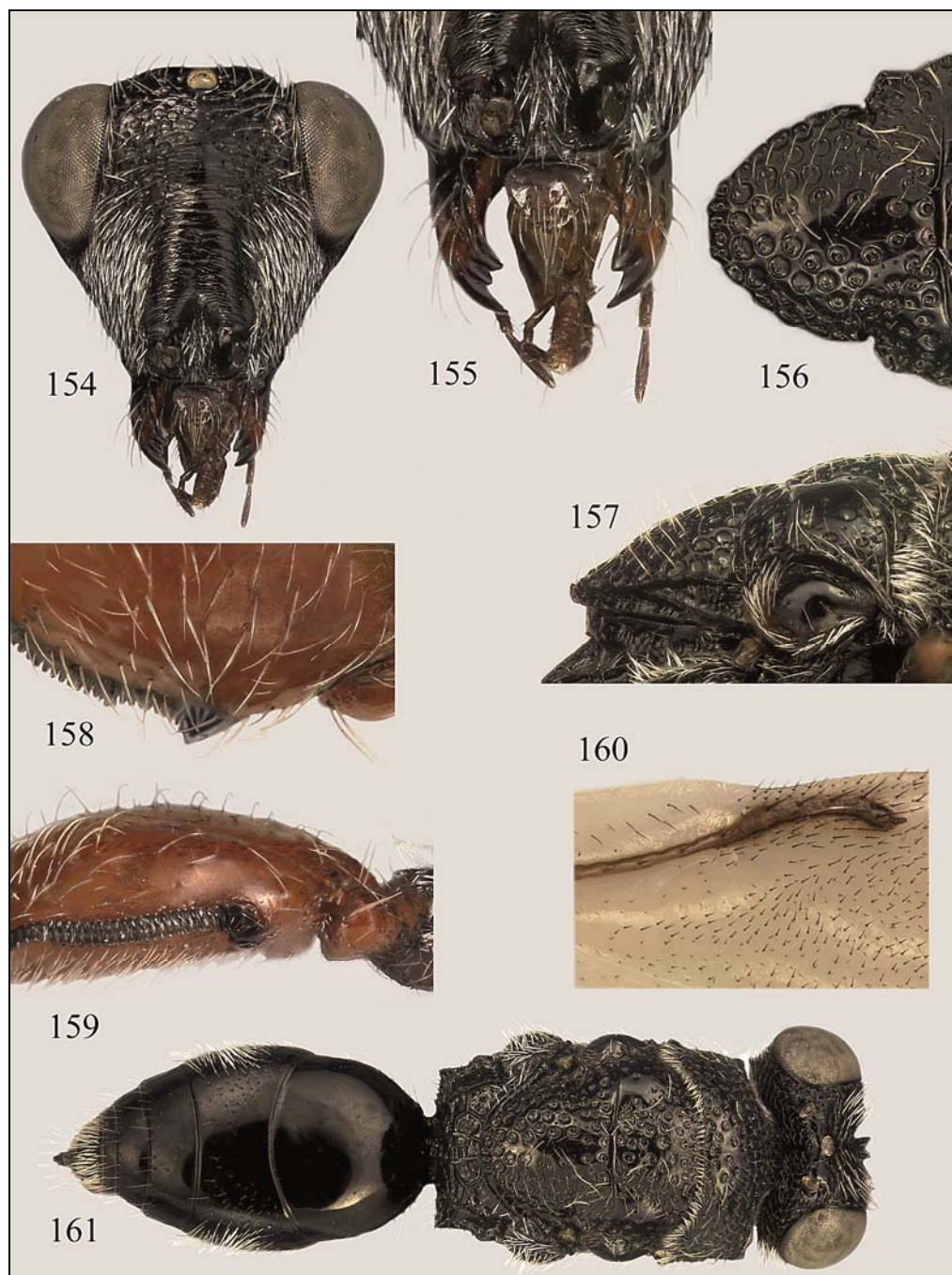
Psilochalcis* ? *crassicornis (Masi, 1929) **comb. nov.** from *Euchalcidia* [*elegantula* species group]

Number of specimens collected: 15. Collecting localities: Al-Ajban, Um al-Quwain, Wadi Bih dam, Wadi Madaq, Wadi Shawkah.

Psilochalcis dentata (Steffan, 1951) **comb. nov.** from *Psilochalcidia* [*dentata* species group]

Plates 154–162

Number of specimens collected: 113. Collecting localities: Ar-Rafah, Sharjah, Um al-Quwain, Wadi Bih dam, Wadi Madaq, Wadi Shawkah, Wadi Wurayah farm.



Plates 154–161. Characters of the genus *Psilochalcis*. *P. dentata* (Steffan) (female). 154: Head in frontal view; 155: Lower face; 156, 157: Scutellum, respectively in dorsal and lateral view; 158, 159: Ornamentation of the metafemur, respectively in lateral and ventral view; 160: Fore wing venation; 161: Habitus in dorsal view.

Psilochalcis levis (Nikol'skaya, 1960) **comb. nov.** from *Cephalochalcidia* [*capitata* species group] Plate 168

Number of specimens collected: 2. Collecting locality: Jebel Jibir.

Psilochalcis patrizii (Masi, 1929) **comb. nov.** from *Euchalcidia* [*benoisti* species group]

Number of specimens collected: 1. Collecting locality: Wadi Shawkah.

Psilochalcis zarudnyi (Nikol'skaya, 1960) **comb. nov.** from *Peltochalcidia* [*benoisti* species group] Plates 169–172

Number of specimens collected: 42. Collecting localities: N of Ajman, ar-Rafah, Sharjah, Sharjah Desert Park, Um al-Quwain, Wadi Bih dam, Wadi Shawkah, Wadi Wurayah farm.

Psilochalcis sp. 1 aff. *crassicornis* (Masi, 1929) [*elegantula* species group]

Number of specimens collected: 40. Collecting localities: Al-Ajban, N of Ajman, ar-Rafah, Um al-Quwain, Wadi Madaq, Wadi Wurayah.

Psilochalcis sp. 2 aff. *crassicornis* (Masi, 1929) [*elegantula* species group]

Number of specimens collected: 2. Collecting localities: Al-Ajban, N of Ajman.

Psilochalcis sp. 3 [*dentata* species group]

Plate 2

Number of specimens collected: 32. Collecting localities: Al-Ajban, SSW of ad-Dhaid, 7 km S of al-Jazirat al-Hamra, Wadi Madaq, Wadi Wurayah.

Psilochalcis sp. 4 [*dentata* species group]

Number of specimens collected: 19. Collecting localities: N of Ajman, Jebel Hafit, Sharjah Desert Park, Um al-Quwain, Wadi Bih dam, Wadi Madaq, Wadi Shawkah, Wadi Wurayah farm.

Psilochalcis sp. 5 aff. *ceratoniae* Delvare, 2011 [*subaenea* species group]

Number of specimens collected: 1. Collecting locality: Wadi Bih dam.

Psilochalcis sp. 6 aff. *elegantula* (Masi, 1929) [*elegantula* species group]

Number of specimens collected: 4. Collecting locality: Um al-Quwain.

Psilochalcis sp. 7 (*benoisti* species group)

Number of specimens collected: 2. Collecting locality: Al-Ajban.

Genus *Proconura* Girault, 1915

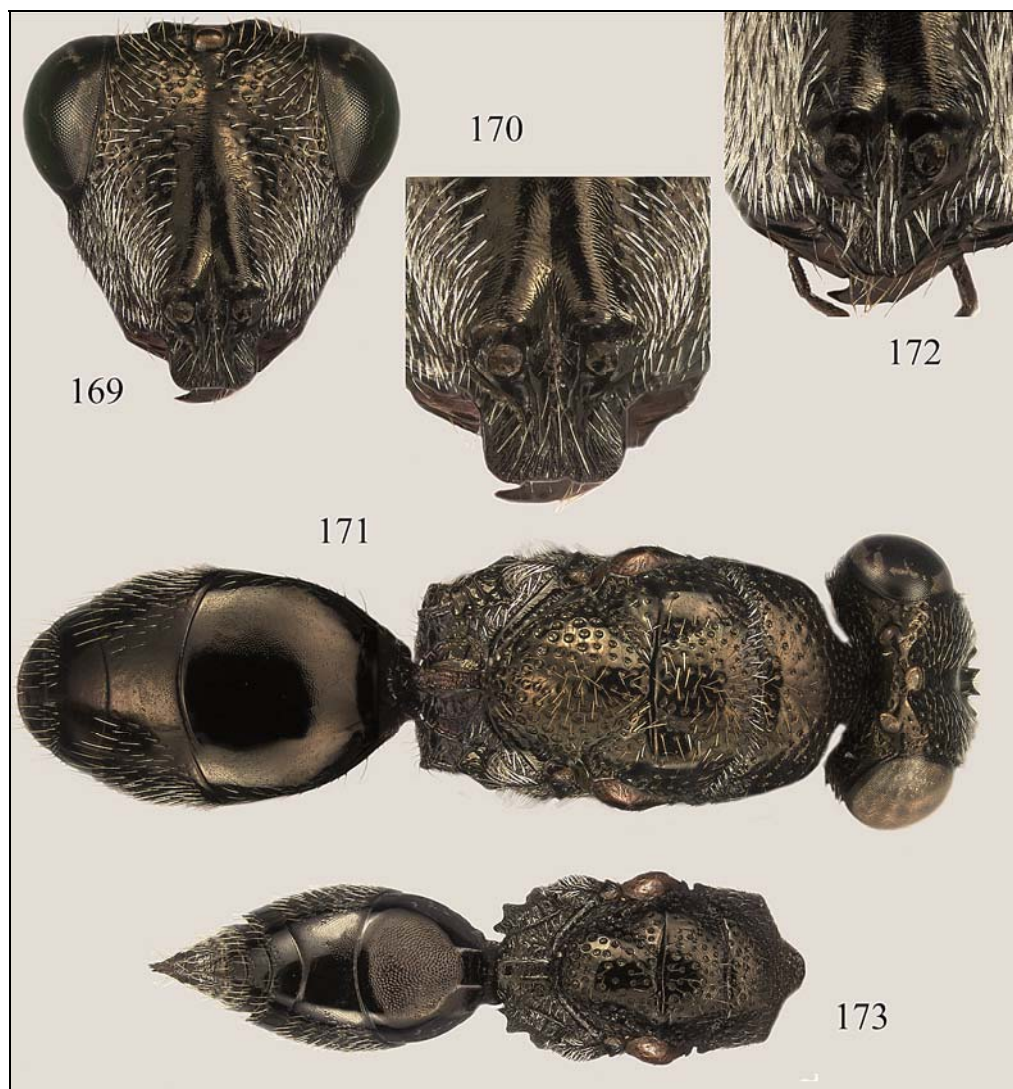
The genus is only known from the Old World with presently 30 valid species. As for *Psilochalcis*, it is most often found in drier places with sparse vegetation. The quoted hosts are quite varied: Moths belonging to Gelechiidae, Pyralidae and Noctuidae (Steffan, 1951a; Nikol'skaya, 1960; Delvare et al., 2011) or their tachinid or braconid primary parasitoids (Steffan, ibidem). Some species parasitize Coleoptera infesting stored products. The biology of *P. caryobori* (Hanna) was studied by the author of the species himself (Hanna, 1935).

The genus was known for some time as *Euchalcidia* until Steffan (1976) discovered that the type species of this genus did not exhibit the special character attributed to it by the authors. Nevertheless the nomenclatural consequence of this discovery was implemented only later by Bouček (1984) who transferred the *Euchalcidia* auctt nec Masi to an available generic name i.e. *Proconura* Girault. The genus is morphologically extremely close to some *Psilochalcis* such as *P. subarmata* (Förster, 1855) and might only figure a special group within it. It can



Plates 162–168. 162: *Psilochalcis dentata* (Steffan) (female), scutellum and propodeum in dorsal view. 163–167: *Psilochalcis (nitida species group)* (female). 163: Mesosoma in dorsal view; 164: Fore wing; 165: Fore wing venation; 166: Hind leg; 167: Habitus in dorsal view. 68: *P. levis* (Nikol'skaya) (female), idem.

only be distinguished from *Psilochalcis* by the presence of submedian carinae at the base of the first gastral tergite; nevertheless they are sometimes short and hence not well distinct. Four species were found in the samples from the UAE, one of them certainly undescribed.



Plates 169–173. Characters of the genus *Psilochalcis* and *Proconura*. 169–171: *Psilochalcis zarudnyi* (Nikol'skaya) (female); 172: Idem (male). 169: Head in frontal view; 170, 172: Lower face; 171: Habitus in dorsal view. 173: *Proconura caryobori* (Hanna) (female), meso- and metasoma in dorsal view.

Proconura barbara (Masi, 1929)

Number of specimens collected: 94. Collecting localities: Al-Ajban, N of Ajman, Bithnah, Jebel Hafit, ar-Rafah, Sharjah, Sharjah Desert Park, Um al-Quwain, Wadi Bih dam, Wadi Safad, Wadi Shawkah.

Proconura blanda (Nikol'skaya, 1960)

Number of specimens collected: 180. Collecting localities: Al-Ajban, Sharjah, Sharjah Desert Park, Um al-Quwain, Wadi Bih dam, Wadi Madaq, Wadi Shawkah, Wadi Wurayah.

***Proconura caryobori* (Hanna, 1934)**

Plate 173

Number of specimens collected: 154. Collecting localities: Al-Ajban, Fujairah, Hatta, Jebel Hafit, ar-Rafah, Sharjah Desert Park, Um al-Quwain, Wadi Bih dam, Wadi Madaq, Wadi Shawkah, Wadi Wurayah farm.

***Proconura* sp.**

Number of specimens collected: 1. Collecting locality: Wadi Shawkah.

Other possible genera

The genera *Tanycoryphus* Cameron, 1905, and *Neochalcis* Kirby, 1883, might also be present in the Arabian Peninsula as they are quoted from Sahara or the Near East on one side and Iran on the other side. *Tanycoryphus* has transverse crests on the pro- and mesonotum, the clava of the female is truncate at apex, and the profemur is somewhat enlarged. *Neochalcis* is very close to *Euchalcis*, the two genera have an additional carina on the outer side of the metatibia, a long postmarginal vein on the fore wing, the membrane of which bears dark setae, even on the hyaline surfaces. The interantennal projection of *Neochalcis* is sulcate and the head is more transverse in frontal view, with shorter genae. *Tanycoryphus* spp. are parasitoids of xylophagous beetles while the species belonging to *Neochalcis* parasitize nesting bees, especially Megachilidae.

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